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ABSTRACT

Nearly forty monographs, papers and journal articles are abstracted in this review of recent literature on instructionally effective schooling. The works, most of them published since the mid-1970s, focus on various aspects of urban, minority, and compensatory education, as well as on more general issues in elementary and secondary educational theory and practice. Each abstract contains a summary of the work's basic premises, as well as detailed descriptions of the research and findings discussed. (Author/GC)

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REVIEW OF INSTRUCTIONALLY EFFECTIVE SCHOOLING LITERATURE

Compiled by

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REVIEW OF INSTRUCTIONALLY EFFECTIVE SCHOOLING LITERATURE

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In the preparation of these abstracts, an attempt was made, wherever possible, to paraphrase the authors' own words in order to present true digests of the publications described.

Studies are cited in footnotes only if they do not also appear in this bibliography. Since the format is alphabetical, any study mentioned in the bibliography may be easily located.

Acland, H. School-Centered Reform: A Study of California's School Improvement Program. (Report to the Carnegie Corporation of New York). Unpublished manuscript, Bay Area Research Group, Palo Alto, 1979.

This document is a research proposal to assess the potential of California's School Improvement Program (SIP) for improving instructional practices, particularly in schools serving disadvantaged populations. The trend toward school-centered reform emerging in several states is associated with the increasing realization that reforms making little use of local initiative have rarely been effective. It is also a response to the growing role of the state in school financing.

California's SIP program intends to improve quality of instruction by altering the decision-making process regarding instructional programs. A School Site Council (SSC) is organized with balanced participation of school and community representatives. The SSC develops a three-year plan defining instructional goals and the methods and support services to be used to meet the goals; the plan is periodically revised on the basis of the school's experience.

In the Rationale section of the document, Acland traces recent experience with centrally-directed school reform and cites the Rand studies as "landmark research" which legitimized the view that centrally-directed reform would be more effective if it fostered local autonomy.[1] At the same time, concern of policymakers with problems of multiple categorical programs has fostered awareness that school-centered reform may provide the most effective mechanism for coordinating such programs.

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[1]For a summary, see Berman, P. and McLaughlin, M.W., Federal Programs Supporting Educational Change (Vol. IV). R-1589/4 HEW. Santa Monica, California: Rand Corpation, 1975.

The author believes that California's School Improvement Program is the most developed of the several examples of school-centered reform. The purpose of SIP is to ensure full development of students' competence in basic skills (language, reading, writing, and math), their progress in other aspects of the curriculum (arts, humanities, sciences, social studies, multicultural education, health, consumer economics, and career education), and their personal and social development. Special attention is directed to educationally disadvantaged students in the school, those whose first language is not English, and exceptional students. The SSC's main task is to develop a school plan responsive to all aspects of SIP legislation. Typically, this involves an assessment of the school's present progress toward its goals, and a needs assessment conducted for all major groups to identify general goals for a three-year period.

The plan includes solutions, deadlines, and methods of evaluation; the SSC has full authority for the SIP budget amounting to $40-50,000 in a typical elementary school (SIP schools receive $148 for each kindergarten to third grade student and $90 for fourth to eighth grade students). The SSC is responsible for monitoring plan implementation. The principal is charged with "promoting compliance." The State Education Department is to provide guidance in the form of written materials and workshops; the district office provides information about the program, technical assistance in planning, and support for activities such as staff development.

The research proposed is an exploration of the factors associated with a successful SIP program through concentration on incentives for participation, formation of the SSC, development of the school plan, and implementation and monitoring of the plan. A small-scale, longitudinal study of SIP schools is proposed, with the goal of increasing understanding

of a new development in education. The design consists of two phases with six schools studied in Phase I and six schools added in Phase II.

Armor, D., et al. Analysis of the School Preferred Reading Program in Selected Los Angeles Minority Schools. Santa Monica: The Rand Corporation, 1976, 85 pp. ED 130 243.

Gains in reading achievement were examined in 20 elementary schools participating in the Los Angeles School Preferred Reading Program. All schools displayed large or consistent gains (in percentile points on national norms) for the sixth grade on the CTBS reading examination between 1972 and 1975, had predominantly minority-group student bodies (about half were mostly Mexican American, the other half mostly Black), were located in low-income neighborhoods, and had 1975 enrollments of at least 400 students.

Principals and reading specialists were interviewed and a questionnaire was administered to sixth grade teachers. Student analyses were conducted on longitudinal files, not on comparisons of scores of successive sixth grade classes in a given school. The reading tests used were found to have high reliabilities for both the large sample of student records and for each school. Though some question arose regarding the validity of test score gains due to test exposure, no such questions as to validity of measured gains were warranted for 90 percent of teachers.

While background factors (such as socioeconomic status, health, ethnicity, and attendance) and reading test scores in earlier grades accounted for the largest part of the variation in sixth grade reading scores -- 57 percent of the variation for Black children and 64 percent for Mexican American children -- other variables reflecting particular school and classroom experiences also had a significant influence for both

Black and Mexican American children.

For Black students, these specific factors were associated with observed gains in reading performance:

--Teacher training in the use of a variety of materials keyed to individual student needs

--Teachers who feel efficacious

--Maintenance of orderly classrooms

--High levels of parent-teacher contact

--Teacher flexibility in modifying and shaping instructional approaches

--Frequent informal consultations among teachers in implementing reading programs

Confidence in the findings with respect to the last three factors was lessened when the analysis excluded all classrooms in which validity of test outcomes was uncertain. Factors not associated with the reading gains of Black children included specific reading program or system, reading strategy (e.g., phonics versus comprehension), and such teacher attributes as ethnicity, experience, and type of education.

Though the reading gains of Mexican American students were almost identical overall to those of Black students, no specific factors were identified in association with these gains. The authors suspect that this is a result of failure to include or accurately measure some key variables such as variations in English fluency.

In a supplementary -- and largely subjective -- study of community involvement in the schools, the authors concluded that in Black neighborhoods, the more vigorous the school's efforts to involve parents and community in school decision-making, the better the sixth grade students fared in reading attainment.

Some of the main conclusions drawn by the authors from this data are:

--Since principals were found to be able to make highly accurate assessments of the instructional ability of their teachers, they should be viewed as an appropriate locus for school-level instructional policy.

--It appears that reading instruction can be improved on a school-by-school and classroom-by-classroom basis when individual programs are carefully planned, adapted to local circumstances, and implemented effectively.

--For Black children, improved reading achievement is associated with a reading improvement program using varied materials for different students at the same time; implementation strategies of adequate teacher training, high level of staff informal consultation, and teacher freedom to modify the reading program; and classroom atmosphere factors of absence of disruption, frequent contact between teachers and parents, and a feeling of efficacy on the part of teachers.

The authors estimate that exposing the average student in the study sample to all the approaches found to be effective would result in a 10 to 20 point percentile gain for that student over the course of the sixth grade rather than the three point percentile decline that occurred.

Austin, G. R. "Exemplary Schools and the Search for Effectiveness." Educational Leadership, 1979, 37, 10-14.

In an historical overview, the author briefly outlines the major findings of research on instructionally effective schooling (Coleman Report, Klitgaard and Hall, and so forth). He explains the Dyer model for predicting student input performance from surrounding conditions like student home and community characteristics not under the direct control of the school. The input variable is a measure of the students' performance at the beginning phase of the schooling to be evaluated. The most common method of implementing the general model is a regression analysis using the mean values of the predictor variable to predict mean output achievement. He lists the findings of longitudinal or case studies of exceptional

schools in New York, Pennsylvania, Delaware, and Maryland, which point out there is no single factor that accounts for a school being classified as exceptional, although these schools appear to have a critical mean of positive factors which, when put together, make the difference.

Most of the reviewed research appeared prior to 1979.

Berliner, D. C. "Tempus Educare." In P. Peterson, and H. Walberg (Eds.), Research on Teaching. Berkeley: McCutchan, 1979.

Berliner believes that "we do know what makes for successful classroom experiences" (p. 1) when talking about elementary school learners, using reading and mathematics achievement test scores as a criterion for success. Evidence to support this statement is then provided; necessary concepts for the interpretation of this evidence are: allocated time, engaged time, success rate, academic learning time, opportunity to learn, content coverage, curriculum-test congruence, and direct instruction.

An examination of data presenting estimates of classroom allocated time shows that some teachers spend considerably more time instructing in particular content areas than other teachers and some teachers allocate considerably more instructional time than do others. As expected, other things being equal, the more time allocated to a content area of instruction, the higher the academic achievement.

Engaged time data are from observer records rather than teacher logs. Such observations revealed dramatic differences, of 100 percent or more, in the engaged time students allot to learn mathematics and reading. The evidence indicated that many second grade classes have cumulative engaged time in both reading and mathematics or under 100 hours for the entire school year. Not surprisingly, differences in engaged time have

been consistently related to differences in achievement.

Academic learning time (ALT) was a research variable of great interest in the Beginning Teacher Evaluation Study.[1] ALT is defined as the time a student is engaged with academic mateirals or activities that yield a high success rate (student understands task and makes only occasional errors). A major finding of this study is that increases in ALT are associated with increases in student achievement. Large differences in ALT were observed in the BTS study; since contributing variables are student's attention and allocated instruction time, both of which vary substantially, a wide range of ALT is a common finding.

The variable opportunity to learn is examined in the Instructional Dimensions Study by Cooley and Leinhardt. This is a composite variable with high score indicative of lower enrollment, higher rates of attendance, higher allocated time in reading and math, fewer transfers in or out, and higher rates of on-task behavior. The results indicated that opportunity to learn, content coverage, and curriculum-test congruence are the important variables discriminating between more and less effective teachers.

Additional variables found to be positively associated with student learning are academic feedback (information given to student about whether his answers were right or wrong), structuring of lessons, giving directions on task procedures, and academic monitoring by teachers.

On the basis of this research data, the author then describes the "learning student" in an effort to help teachers consider what they are trying to accomplish in the classroom. The paper concludes with the fol-

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[1]Published by Far West Laboratory for Educational Research and Development, 1977.

lowing recommendations for improving schooling:

1. Ways are needed to monitor allocated time in the classroom and to increase it if it is low. This monitoring would lead to a confrontation with the most important issue facing teachers, school districts, and state agencies: What is to be taught?
2. An intensive examination of the school curriculum, teacher allocated time, and the content of examinations is needed to assure congruence.
3. Strategies should be adapted to assure that success rate in the chosen curriculum is high.
4. The process variable of academic learning time, when materials and activities are matched to tests, can be used as a proxy variable for end-of-unit achievement.
5. Teaching functions, rather than teaching methods or skills, are important. Though patterns of effective instruction vary from teacher to teacher, the functions of diagnosis and prescription, monitoring, and feedback must be provided.
6. Due to the complexities of the classroom today, a conception of the teacher as executive is important in teacher training.
7. Heavy investment in technological aids of any kind is suspect since the match between what these materials teach and both assessment tests and the accepted curricula is usually quite poor.

Bloom, B. S. "Time and Learning." American Psychologist, 1974, 29, 682-88.

Bloom begins by citing research, such as the Coleman report and the International Study of Educational Achievement, which indicates that acci-

dents of birthplace and geography determine that "a student in one set of communities and schools may spend 1 1/2 - 2 years to learn what a student in another set of communities and schools will learn in 1 year" (p. 682).[1]

He then refers to his own work in elementary schools, which indicated that four fifths of students eventually reach a criterion of achievement that one fifth of students attained two years earlier. Several studies conducted in the 70's found that about 80 percent of students can achieve under mastery learning conditions at the same level as the upper 20 percent of students under conventional conditions. Approximately 20 percent extra time and help was required to reach these higher levels; this time was spent on feedback procedures to identify learning gaps followed by corrective procedures. The extra time cost was usually borne by the individual student since it was outside classroom instruction time. In addition to time and cost savings, this method has the advantage of leaving the student with the belief that he is doing as well as others with the consequent psychic and motivational rewards.

The Carroll model[2] of school learning is presented wherein time is presented as a central variable in school learning. Carroll defines aptitude as the amount of time needed by a student to reach some set criterion in a given learning unit. This focus on time as a crucial variable in school learning produces a major shift in thinking about education as it implies that, if teachers can define an appropriate achievement criterion, then it becomes the responsibility of teachers and schools to pro-

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[1]Published under the series International Studies in Evaluation. New York: Wiley, 1973.

[2]Carroll, J. B. "A Model of School Learning." Teachers College Record, 1963, 64, 723-733.

vide the time necessary for students to attain the criterion. It also becomes possible to use time as an index to determine the effectiveness of teaching methods and the quality of instructional material.

Carroll's model was used as one basis for the idea of mastery learning, which assumes that provided with the necessary time, help, and motivation to use the time available, most students can be brought to the criterion level of achievement. Studies of various subjects in which learners are free to proceed at their own rate indicate that aptitude and general intelligence test scores predict time required by individuals to complete a learning unit to criterion. In mastery learning studies, a criterion-based test is given at the end of group-based instruction for a learning unit; the test determines which children have reached mastery and which need additional time and help prior to reaching this criterion. When time and help are given and when students are motivated to use this time and help, 90 percent or more attain the criterion.

An additional, and very interesting, finding has been that when this process is repeated over a number of special learning units, student variation in elapsed time to reach criterion mastery keeps decreasing on successive units. A related finding is that while aptitude and intelligence tests are predictive of time and help needed in the early learning units in a series, they are relatively poor predictors of time and help needed in the later learning units and of the final level of learning.

From these and other findings Bloom concludes that extra time and help in the early learning units contribute to the student's improved instruction and become prerequisite learning for subsequent units, while such time and help devoted only to later learning units are unlikely to significantly improve student performance.

Students studying under mastery learning conditions were found to spend about 85 percent of classroom time on task during the final task while the nonmastery students were spending only about 50 percent on task. Bloom attributes this phenomena to three characteristics of the learning situation:

--Students provided with feedback and extra time and help enter successive learning tasks with the prerequisite learning tasks which are highly related to both achievement levels on subsequent tasks and to ability to concentrate.

--As students reach adequate achievement levels on preceding tasks, their confidence and interest in the task increase.

--When quality of instruction (process of original instruction, feedback, and corrections) is high, student achievement levels and time on task increase.

Bloom concludes by noting that the clear and statistically significant difference between mastery learning classes and conventional classes reflects differences in the percent of elapsed time during which students are actively engaged in the learning process. He contends that such time comparisons may be a more useful way than intelligence/aptitude/achievement/test comparisons to determine human variation, especially when individuals are brought to a fixed criterion of attainment or achievement.

Bloom, B. S. Human Characteristics and School Learning. New York: McGraw-Hill, 1976.

The theory of school learning presented in this book attempts to explain individual differences in schooling as well as determine ways in which such differences may be altered in the interest of student, school, and ultimately, society. Two basic assumptions underlying this theory are:

--The history of the learner is at the core of school learning.

--Modifications are possible in the entry characteristics of the individual (prerequisite learning and motivation for learning), in the instruction for the learner (quality instruction), or in both.

Bloom contends that, where conditions for learning in the home and school approach some ideal, individual differences in learning should approach a vanishing point. If the characteristics of students and of instruction discussed in this book are, indeed, alterable, then changes in the school environment can relatively quickly make changes in student learning. These characteristics of the theory are then defined in detail, with past research results discussed and future research directions suggested. Briefly described, these characteristics are;

1. A learning unit, which contains a variety of ideas, procedures, or behaviors to be learned over a relatively short time period. Examples are a chapter in a textbook, a learning unit in a course, or a topic in a curriculum.
2. Cognitive entry behaviors comprise prerequisite learning needed for a particular learning unit. Research evidence suggests that cognitive entry behaviors are causal links in determining learning and in accounting for cognitive educational achievement.
3. Affective characteristics, which refer to the compound interests and attitudes toward subject matter of the learning task and the school and schooling; they also include more deep-seated self-concepts and personality characteristics.
4. Quality of instruction defined in terms of particular characteristics of the interaction between instruction and students. Level of participation appears to be the strongest symptom of

this entire characteristic. Research indicates that cues, participation, and reinforcement account for at least 20 percent of the variation in student learning.

According to Bloom, the variables of cognitive entry behaviors, affective entry characteristics, and quality of instruction, when properly taken into consideration, account for almost all of the variation in pupil achievement. Supporting research is then discussed in terms of processes involved in micro-level studies, evidence in support of process changes, and evidence in support of the model.

In conclusion, Bloom maintains that schools are potentially able to make very great differences in the careers and lives of their students. Too often the present situation results in the conversion of one set of major flaws in the educational system into the student's feelings of inadequacy as a learner and, consequently, aspirations for further learning are lowered. A second set of flaws becomes evident when the student does not adequately develop the cognitive learning and other prerequisites needed for subsequent learning. A system of feedback to teacher and students can reveal errors in learning shortly after they occur and, with instroduction of appropriate corrections as needed, the system can become a self-correcting one.

This self-correcting system of schooling is a minimal-error education system insofar as learning errors can be reduced as they occur. Bloom contends that much of individual differences in achievement to date are the effects of a system of schooling that is full of errors. A minimal-error system, on the other hand, may approach the effectiveness for learning of a tutoring system "in which a highly gifted and sensitive tutor interacts with one student at a time" (p. 212).

Though Bloom and colleagues are optimistic about the results of testing this model over a term or year in particular courses taught by highly motivated teachers, they are pessimistic about the likelihood of a school or school system making this effort over a school's entire curriculum and different levels of learning.

Bossert, S. T. Activity Structures and Student Outcomes. Paper presented at the National Institute of Education's Conference on School Organization and Effects, January 1978.

Bossert contends that educational research to date has made a minimum contribution to an understanding of schooling since it has ignored the fact that education is a social activity with outcome influenced by form of social organization. Most studies have measured inputs and outputs with no attempt to analyze processes that shape teacher and student behavior. An activities structures perspective is advocated as an important effort to move beyond simplistic behavioral models in educational research.

This perspective is based on the notion that individuals experience the world in the context of their pursuits and that activities shape individual experience by structuring the temporal and reciprocal relations among phenomena and actions. At the basic level, an activity structures perspective specifies the tasks encountered and the length of time and number of repeitions involved. Regardless of content, level of learning is influenced by the temporal ordering of activities and by the pacing, sequencing, and similarity among activities.

The form of an activity affects student outcomes both directly and indirectly. Greater achievement may be stimulated through increasing student time on task in certain activities. Activity forms, linked in a temporal structure, determine the development of activity specific skills

and norms; those forms that receive continued reinforcement become more generalized knowledge and norms. Indirectly, the activity structure shapes interpersonal relations by determining the opportunities for interaction and the bases for social assessments. An activity structure, particularly the extent to which students engage in common collective tasks, affects the nature of student social ties.

Bossert asserts that students experience schooling as a set of activities and that, to the extent that these activity experiences differ, so do the technical and moral outcomes derived from schooling. He draws on current research regarding schooling processes as well as on other social science research to indicate fruitful relationships between activity structures, socialization and learning processes, and schooling outcomes.

In relating this approach to teacher behavior, Bossert cites research indicating that the structure of an activity may influence how teachers construct pedagogical decisions, since the teacher's perception of student or class performance may result from the patterns of interaction inherent in the activity itself. Initial teacher choices as to what activities to use, then, shape other classroom decisions and these, in turn, may affect how much pupils learn.

An activities structures perspective also suggests some mechanisms by which schools produce moral outcomes. The use of reference group or interpersonal comparisons, for example, depends on within-group identifications and common performance standards that can derive from common recruitment activities. Schools provide activity structures that differ from other settings experienced by students, thus increasing student repertoire of behavioral norms.

A small body of research exists which has begun to examine how

variations in the form, content, and timing of student activity experiences affect learning. Single and comparative case studies, usually based on ethnographic research methods to examine classroom and school interactions, have resulted in the generation of a set of grounded propositions about schooling processes that capture the complexity of relationships between structural elements and social behavior; the most useful of these employ comparative case designs. The author sees this development as an important movement toward utilization of research designs that capture the complexity of schooling as a social activity.

Bridge, R. G., Judd, C. M., and Moock, P. R. The Determinants of Educational Outcomes: The Impact of Families, Peers, Teachers, and Schools. Cambridge, Massachusetts: Ballinger, 1979.

The authors begin by observing that despite differences in short-term goals, theoretical emphases, vocabularies, and preferred levels of analysis, economists, sociologists, and psychologists share a common interest in the general determinants of educational outcomes. These disciplines also rely upon essentially the same statistical model. This book is the authors' attempt to "meld the different vocabularies and emphases of economics, sociology and psychology into a single comprehensive consideration of the determinants of educational outcomes" (p. 4).

The critical assumptions underlying the input-output studies of schooling effectiveness are:

--Outcomes are the product of combinations of interacting inputs.

--Some inputs may be effective only when applied during certain critical periods or in certain immutable sequences, while others may be ineffective unless certain minimum amounts are applied.

--In theory, some inputs can be substituted for others without reducing educational outcomes; such substitution is desirable if it reduces cost while maintaining the same level of outputs.

--Translating research results into policy recommendations involves three principles: (1) tractable sources of variance are all that matter when it comes to policy formation, (2) cost information must be combined with information about magnitudes in order to minimize total cost per unit of output, and (3) since interventions have multiple consequences, planned and unforeseen, feedback effects must be anticipated and tested experimentally before large-scale changes are promulgated.

In a subsequent chapter, the authors discuss the pitfalls in the use of standardized tests as outcome measures, and review other outcome measures. They then proceed to explain the use of linear models in the social sciences, with detailed explanation of the least-squares regression analysis yielding estimates of the parameters of the intercept (value of the dependent variable -- or output -- when all explanatory variables -- inputs -- are zero) of the slope (the effect of a particular input on outputs, other inputs held constant) and the coefficient of multiple determination (the proportion of the variance in the output related systematically to the inputs of the model). This discussion is then extended to demonstrate the application of several types of non-linear relationships and to discuss the problems of multicollinearity and omitted explanatory variables or proxy variables.

The rest of the book is devoted to an examination of the effects of inputs into the educational process as reported in various studies and to recommendations regarding future research directions. The Coleman report, the reanalysis of Equality of Educational Opportunity (EEO) data by Mayeske[1], and the International Educational Achievement Project[2] are

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[1]Mayeske, G. W., et al. A Study of Our Nation's Schools. Washington, D.C.: Office of Education (DHEW), 1972. Mayeske, G. W., et al. A Study of the Achievement of Our Nation's Students. Washington, D.C.: Office of Education (DHEW), 1973.

[2]Wolf, R. M. Achievement in America. New York: Teachers College Press, 1977.

reviewed as three large-scale analyses of educational production using the variance-partitioning strategy to estimate the effects of inputs. These studies, according to the authors, suffer in varying degrees from the following main problems:

--The variance in the dependent variable jointly explained by two or more inputs is assigned to the first input to enter the regression or is left unassigned.

--Findings are not easily translated into policy.

In an assessment of the validity of the conclusions of these three studies, the authors compare them to study findings that are not based on the variance-partitioning approach. They then present the following conclusions as tentative guides to future research:

--For both Blacks and Whites, reading achievement tends to be greater for females than for males.

--Though the results pertaining to verbal achievement are less clear, it appears that females hold some advantage here again.

--Among White children, females tend to be at a disadvantage in mathematics.

--Kindergarten atterdance contributes to verbal, mathematics, and reading achievement, and the effects appear to last through at least the sixth grade.

--The older a child relative to his classmates, the less well that child tends to do on verbal and mathematics achievement tests.

--A feeling of control over the environment (i.e., internal control) contributes positively to verbal achievement.

--A positive self-concept contributes positively to verbal achievement.

--The greater a child's academic motivation, as measured by grade aspirations, the greater the child's verbal achievement.

--Reading comprehension, verbal achievement, and mathematics achievement benefit significantly from time spent in school.

--Verbal and mathematics achievement decline as the number of children in the family or the number of people in the household increases, even when other family characteristics remain the same.

--The effect of family size upon achievement when social class is controlled for may be an indirect effect, at least among White students.

--Parents' education seems to affect positively the mathematics and verbal achievement of both elementary and high school students, even when other measures of family background are controlled for.

--The relationship between parents' education and student achievement may be somewhat weaker for Black students than for White students. However, the less evident effects reported for Blacks may be due simply to less variation in parents' education among Black families in the samples.

--The higher the parents' occupational status, the higher their children's reading, mathematics, and general academic ability.

--Family income seems to have a positive effect on both verbal and reading achievement. However, the effect is not found with achievement growth.

--Generally, various measures of housing arrangements are not related significantly to achievement.

--Indices of possessions in the student's home seem related to measures of achievement, both verbal and mathematical, even when various other measures of family economic status are controlled for.

--Parental educational expectations for the child and the general educational environment of the home seem to make a positive difference in achievement.

--Attending school with economically advantaged peers is associated with higher verbal and reading achievement and with higher abstract reasoning ability.

--For Black students, a higher proportion of Black peers in school seems to be associated with lower verbal and mathematics achievement.

--For White students, the racial composition of peers is not clearly related to achievement.

--The ability of the peer group may be positively related to a student's own achievement.

--Whether or not the extent of student turnover in individual classrooms is associated with differences in achievement is unclear.

--The educational attainment of teachers seems to have a positive effect on reading and verbal achievement when it has an effect.

However, this has been shown only with aggregated data where education may be a proxy for student socioeconomic status.

--For mathematics at the elementary school level, there appears to be a negative relationship between a teacher's educational attainment and student achievement.

--There appears to be a negative relationship between a teacher's having majored in education at college and the verbal achievement of students.

--There seems to be a positive relationship between the "prestige" of a teacher's undergraduate institution and the reading achievement of students.

--The more recent a teacher's last educational experience, the more students seems to achieve in reading.

--Apparently no relationship exists between student achievement and a teacher's being certified or tenured.

--The relationship between teaching experience and student achievement is likely to be curvilinear -- steeply positive over the first years of experience and flat (or negative) thereafter.

--The less diversified a teacher's teaching load, the more students achieve.

--The smaller the percentage of class time given to discipline, the more students achieve.

--The verbal ability of teachers seems to have a positive effect on the verbal (and perhaps the reading) achievement of students.

--Men seem more effective than women in teaching Black inner-city elementary school children.

--Men seem less effective than women in teaching abstract reasoning to low-income high school seniors.

--Black teachers seem more effective than White teachers in teaching Black inner-city children.

--Black teachers seem less effective than White teachers in teaching White elementary school children.

--There appears to be no relationship between a teacher's marital status and student achievement.

--Expenditure per pupil has a positive effect on a student's achievement; however, the effect is indirect.

--Tracking seems to have a negative effect on verbal and mathematics achievement among Blacks and Whites alike.

--Size of school or district appears to be unrelated to student achievement.

--It has not been demonstrated that the ratio of professional staff to teachers is related to the achievement of students.

--The amount of guidance services that students receive is positively related to achievement.

--Teacher turnover is negatively related to both verbal and mathematics achievement.

--Where it shows a statistically significant relationship, teachers' salaries are positively related to the achievement of students.

--Where it shows a statistically significant relationship, physical plant is positively related to student achievement.

--In general, there seems to be no relationship between the age of school buildings and the achievement of students.

--There seems to be no consistent relationship between achievement and the availability or current acquisition of library books and other teaching materials.

--An additional student in class is sometimes found to have a positive effect, sometimes a negative effect and sometimes no effect at all on the average achievement of students. The true effect of class size may be curvilinear, and within the full range of possible class size values, the direction of the effect changes.

--There is a positive relationship between the length of the school year and cognitive achievement.

Brookover, W. B., and Lezotte, L. W. Changes in School Characteristics Coincident with Changes in Student Achievement. East Lansing: Michigan State University, College of Urban Development, 1979. 112 pp. ED 181 005.

This is an in-depth analysis of eight elementary schools, six of which were characterized by improving student achievement and two by declining student achievement. Since the establishment of the Michigan Educational Assessment Program (MEAP) in 1971, annual tests have been given to all Michigan public school fourth- and seventh-grade students in

the content areas of reading and math; the MEAP provides building level summaries of the students' performance on these tests. Since the test format, the objectives being assessed, and the types of items utilized in each grade and content area have remained constant, the building level test results for the past three years provide an "overtime" perspective on the building level achievement for fourth- and seventh-grade students in every Michigan public school.

This research project was initiated in response to the fact that the building level assessment scores in some schools evidenced a steady improvement and others a steady decline over the past three years. The research question, then, is: What changes occurred in the "improving" or "declining" schools that coincided with the changes in measured achievement? The factors discovered to differentiate between these improving and declining schools were:

1. Improving schools accent and emphasize the importance of goals and objectives in basic reading and math.
2. The staffs of the improving schools tend to believe that all of their students can master the basic objectives and, furthermore, the teachers perceive that the principal shares this belief.
3. The staffs of the improving schools hold decidedly higher and apparently increasing levels of expectations with regard to the educational accomplishments of their students.
4. Teachers and principals in improving schools are much more likely to assume responsibility for teaching the basic reading and math skills and are much more committed to doing so.
5. Teachers in declining schools spend less time in direct reading instruction than do teachers in improving schools.

6. In the improving schools, the principal is more likely to be an instructional leader, more likely to be assertive in his instructional leadership role, is more of a disciplinarian, and assumes responsibility for the evaluation of the achievement of basic objectives.

7. The improving school staffs appear to evidence a greater degree of acceptance of the concept of the individual teacher's accountability and are further along in developing an accountability model; they accept the MEAP tests as an indication of effectiveness to a greater extent than the declining school staffs.

8. Higher levels of reported staff satisfaction and morale in the declining schools seem to reflect a pattern of complacency and satisfaction with the current levels of educational attainment.

9. Differences in the levels of parent involvement in the improving and declining schools are not clear cut, suggesting that we need to look more closely at the nature of the involvement exercised by parents.

10. The compensatory education program data suggest that improving schools are not characterized by a high emphasis upon paraprofessional staff nor by heavy involvement of regular teachers in the selection of students to be placed in compensatory education programs.

Clark, D. L., Lotto, L. S., and McCarthy, N. M. Exceptionality in Urban Elementary Schools. (A report prepared as part of the Exceptional Urban Elementary Schools Project.) Indianapolis: Phi Delta Kappa, 1979.

The authors of this secondary source study offer some conclusions regarding what is known about exceptionality in urban elementary schools

aggregated from three data bases:

--Case studies, limited in scope to single schools or school districts (86 cases after screening)

--Research, development, and evaluation reports encompassing multiple schools in multiple school districts (40 studies that passed screening procedures)

--Interviews with urban school researchers, change agents, and policy makers (11 interviews)

Four major categories of dependent variables were used in this analysis:

--Student achievement

--Student attitudes toward school and toward self as learner and self concept

--Teacher attitudes toward school and toward student(s) as learners

--Community attitudes toward school

A chapter is devoted to the conclusions resulting from each data source. A set of generalizations summarizing what is known about exceptionality in urban elementary schools, categorized according to specific school variables, is presented, synthesizing conclusions from all three sub-studies:

1. Leadership: Behavior of the designated school or program leader is crucial in determining school success. Principals, as designated leaders of comprehensive school units, are particularly important. It is the leader's attitude toward, or philosophy of, urban education along with his expectations for school or program success, rather than a specified set of personal or professional characteristics that determine a leader's effect.

2. Teachers and Training: Successful schools and programs fre-

quently utilize staff development or in-service training programs to realize their objectives. The greater the specificity of focus of a training program in terms of goals or processes, the greater the likelihood of success.

Reduced adult/child ratios are associated with positive school performance.

3. Finance: Successful schools and programs are often supported with special project funds from Federal, State and local sources.
4. Resources and Facilities: Resource and facility manipulations are insufficient to affect school or program outcomes.
5. Curriculum and Instruction: Successful urban elementary schools and programs are characterized by clearly stated curricular goals and objectives, with an emphasis on reading and math achievement. Structured learning environments are particularly successful in urban classrooms, and techniques of individualized instruction are frequently employed in these successful classrooms.

   Success in these classrooms appears to be unrelated to any particular curricular organization such as open classrooms, homogeneous grouping or a particular instructional strategy such as programmed instruction, language, experience approach, etc.
6. Community Resources: Successful urban schools are characterized by high levels of parental contact with the school and parental involvement with school activities.

The variables relating to leadership, teachers and training, and curriculum and instruction were found to be more directly related to school

improvement and success as supported by all three sub-studies. In addition, the data support the contention that school improvement efforts are more likely to be successful if they concentrate on relatively narrow targets and clearly defined goals. In stressing the interrelationship of these variables, the authors conclude that the major elements necessary for urban school success have "debilitating effects if they are not in balance and synergistic consequences" (p. V-11) if they are.

The authors are optimistic regarding reform and improvement efforts since successful programs currently exist with program and personnel characteristics not so unique as to be considered unattainable by large numbers of urban schools.

Cohen, M. Recent Advances in Our Understanding of School Effects Research. Paper presented at the meeting of American Association of Colleges of Teacher Education, Chicago, 1979. 23 pp. ED 169 053.

Cohen reviews a decade of research on school effects, drawing some insights to justify his conclusion that future research needs to focus largely on the social organization of the classroom.

The author believes that most of the research community felt that the challenges to the Coleman report had not been nearly as damaging as educators had hoped they would be. In other words, the interpretation that schools don't make a difference persisted. In addition, the methodological debates characteristic of the reanalyses of the Coleman report have not been useful in improving the ability to answer the important policy and theoretical questions underlying school effects research.

Little of this school effects research was designed to reveal much about the particular resources, instructional processes, reward systems, or activity patterns contributing to differences in student achievement.

The narrow set of performance indicators used were insensitive to individual teacher or program efforts and did not reflect important aspects of student motivation and development. Such research also overlooked the fact that most of the variance in student achievement (between 69 and 90 percent) actually occurs within schools.

Research to date has, however, provided the following insights which indicate that future research should concentrate on social organization beginning with the classroom:

1. The findings that the socioeconomic composition of the school is the most important school factor influencing achievement have been interpreted to suggest that the student body and particular friendship groups serve as reference groups providing role models, standards of comparison and expectation systems that influence the academic behavior and achievement of individual students.
2. Recent input-output studies suggest the value of looking at within-school rather than between-school influences on student achievement.
3. Focusing on both teacher and student time (which can vary considerably in the amount available and actually used for instructional purposes) as well as on how it is organized, allocated, and differentially available to students, provides new ways of thinking about this school resource.
4. By social organization of classrooms, Cohen means those structures, processes, and systems used to sort students for instructional purposes; to evaluate, motivate, and reward students; to control and direct student behavior; and to the nature of the

instructional tasks and activities. Though there is no coherent "theory" in this field, related studies recognize the important aspects of schools and classrooms:

> --Student attendance in schools is compulsory, thus students' willing engagement in the school's formally prescribed activities must be treated as problematic, not taken for granted.
>
> --Classrooms are collective social settings and teaching must be viewed as the act of managing the behavior of individuals in groups.

Cohen then cites several research efforts that illustrate the kinds of findings anticipated in future studies of classroom social organization:

Reward Structures: Evidence indicates that some combination of formal reward and grading systems and informal peer group norms can be powerful determinants of student behavior. Cohen refers to a series of experiments conducted at the Center for Social Organization of Schools,[1] which utilizes a classroom organization scheme called Team-Games-Tournaments involving a fundamental reorganization of traditional classroom reward systems and grouping practices, emphasizing even competition between individuals and incentives for student cooperation.

Activity Structures: The activity structure perspective is currently being developed by Bossert. Five distinct but interrelated activity dimensions are the focus: grouping of students, number and complexity of different tasks expected of students, extent to which completion of tasks requires coordinated as opposed to individual behavior, extent of student choice involved in selecting and organizing task and nature of the evaluation system--particularly the extent to which evaluation is public. Bossert argues that

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[1]DeVries, D. L. and Slavin, R. E. Teams-Games-Tournament: A Final Report on the Research. Report No. 217. Center for Social Organization of Schools, The Johns Hopkins University, 1976.

activity structures differences produce different roles and expectations for students, shaping their perceptions of appropriate behavior and also influencing the form of teacher-pupil bonds created and the type of authority teachers can exercise.

Organization and Allocation of Time. Research to date has indicated that, in order to use time flexibly in the classroom, new organizational arrangements are necessary, the nature and consequences of which are just now becoming topics for the attention of researchers.

In conclusion, Cohen predicts that much of the work in the near future will be descriptive; subsequently, researchers can begin to more directly address the question of effects of variations in classroom social organization on student learning. He suggests some issues to be raised at the school level and a number of both organizational and management issues. likely to influence school effects.

Cooley, W. W., and Leinhardt, G. "The Instructional Dimensions Study." Educational Evaluation and Policy Analysis, 1980, 2(1), 7-25.

In responding to a 1974 National Institute of Education (NIE) request for proposals contrasting individualized instruction with "standardized instruction," Cooley and Leinhardt recommended that individualized and standardized instruction be conceived of as differing in degrees along common dimensions, rather than as distinctly different types of instruction.

NIE adpated this recommendation and the authors' study design, and launched the Instructional Dimensions Study (IDS) in the fall of 1976. In this paper the authors discuss the results and implications of the portion of this IDS which attempted to identify effective classroom processes in

regular classroom settings, particularly those effective in teaching reading and math to "disadvantaged" children in primary grade classrooms.

The IDS design included the following distinguishing features:

1. A model of classsroom processes in which constructs -- sets of variables -- are used to explain variation in student performance. Classroom processes are represented by the constructs of opportunity (representing how time is spent in classrooms and the similarity of the curriculum to the tests), motivators (those aspects of the curriculum and in-class interpersonal behavior that encourage learning), instructional events (content, frequency, quality, and duration of instructional interaction) and structure (level of organization of the curriculum, the specificity of the objectives, and the manner in which a student and a curriculum are matched).

   A setting variable is also included in the analyses; this variable is a function of the number of children pulled out of a classroom for special instruction in reading and math and the amount of time devoted to such pull-out instruction.
2. Direct measurement of classroom processes.
3. Distinctive outcome measures in the form of commercially available reading and math achievement tests believed by the authors to be superior in reliability, in content validity, and in elimination of social bias (Comprehensive Test of Basic Skills of the California Test Bureau).
4. Distinctive sampling procedures which emphasized the need to achieve variance in classroom processes rather than representativeness of current compensatory practices.

5. Distinctive methods of analysis including commonality analysis (a variation of regression analysis that distinguishes between unique effects and effects that are common to two or more of the predictor variables) and use of the classroom, rather than the student, as the unit of analysis.

The techniques of teacher interviews, analysis of curricula by curriculum experts, and videotapes of classroom activities were used to measure classroom process variables. Process measures were standardized and averaged to form variables, which in turn were grouped into the four constructs of the model.

The major study results include

--The most useful construct for explaining achievement gain is the opportunity that the children had to learn the skills assessed in the achievement test.

--The next most highly correlated variable is the matching variable of structure for mathetmatics and the time variable of opportunity for reading.

--The amount of time scheduled for a specific subject bears little relation either to gain or to raw achievement.

--There was no consistent relationship between class size and achievement.

--Too much management information distracts from cognitive instruction.

--The techniques that appear to be most highly related to gain include focusing a child's attention on the task, referring to earlier curriculum materials, referring to earlier performance, and effective classroom management.

--An absence of evidence of the superiority of individualized instruction over other methods of compensatory education was found.

--The extent of pull-out instruction taking place in classrooms was not related to achievement of children.

The study revelaed two major problems in assessing the effectiveness of individualized instruction. First, measures of individualization are

still not sufficiently developed to provide the reliability needed for detecting program effects. Second, the range of individualizing processes still does not offer the theorietical ideal of individualization.

Several instructional implications which the authors derive from study findings are

--Curriculum content is important, since children perform better on a test if they have been exposed to both the form of the test items and the content covered by the test.

--Classroom instruction should emphasize the cognitive rather than the managerial.

Edmonds, R. "Effective Schools for the Urban Poor." Educational Leadership, 1979, 37, 15-27.

Edmonds initiates discussion by offering the following standards:

--Equitable public schooling begins by teaching poor children what their parents want them to know and ends by teaching them at least as well as it teaches middle-class children.

--Inequity in American education deirves first and foremost from our failure to educate the children of the poor. Education in this context refers to early acquisition of those basic school skills that assure pupils successful access to the next level of schooling.

A discussion of some relevant research literature on school effects follows. Edmonds maintains that "there has never been a time in the life of the American public school when we have not known all we needed to in order to teach all those whom we chose to teach" (p. 16). Research results, he observes, may illuminate that fact but they do not change it.

Weber's 1971 study[1] of four instructionally effective inner-city schools is reviewed; schools with success in reading achievement progress

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[1]Weber, G. Inner-City Children Can be Taught to Read: Four Successful Schools. Washington, D.C.: Council for Basic Education, 1971.

of poor children had strong leadership, high expectations for all students, strong emphasis on pupil acquisition of reading skills, and frequent evaluation of pupil progress. The 1974 State of New York's Office of Education Performance Review study[1] confirmed these findings.

Edmonds continues his literature review with a discussion of the Brookover and Lezotte study in Michigan which he believes is is broader in scope than the two earlier studies and explicitly intended to profit from methodological and analytical lessons from past research. This study, summarized elsewhere in this document, reinforces the conclusion that leadership, expectations, atmosphere, and instructional emphases are essential institutional determinants of pupil performance.

After revieweing his own research results, Edmonds summarizes the most tangible and indispensable characteristics of effective schools as follows:

--Strong administrative leadership

--Climate of expectation in which no child is permitted ot fall below minimum but efficacious levels of achievement

--Orderly, quiet atmosphere which is neither rigid nor oppressive

--Philosophy that pupil acquisition of basic school skills takes precedence over all other school activities

--Frequent monitoring of pupil progress

Edmonds decries the tendency among social scientists and opinion-makers to espouse the belief that family background is the chief cause of the quality of pupil performance since this belief has the effect of absolving educators of their professional responsibility. He believes that

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[1]State of New York, Office of Education Performance Review. "School Factors Influencing Reading Achievement: A Case Study of Two Inner City Schools." 1974.

the contribution of the educational research establishment represented by NIE and AERA to our national discourse on educational equity illustrates the point that "the poor are far more likely to be served by politics than by any equity interests to be found in the educational research establishment" (p. 23).

In a response to Edmonds published in the same journal, Scott and Walberg[1] argue that Edmonds is wrong in singling out the schools alone for improvement. They note the major problems in schools, but reaffirm the important role of home and family environment on school learning. A detailed review of Edmonds' own research methodology and findings is presented. The authors conclude that "educators alone are insufficient to increase learning productivity dramatically, and they need the cooperation of parents and students themselves" (p. 27).

Edmonds, R. R., and Frederiksen, J. R. Search for Effective Schools: The Identification and Analysis of City Schools That are Instructionally Effective for Poor Children. 1979. 66 pp. ED 170 396.

The Search for Effective Schools project, which began in 1974, posits as its underlying thesis that "all children, excepting only those of certifiable handicap, are eminently educable, and the behaviour of the schools is critical in determining the quality of that education" (p. 4). Through an analysis of pupil performance in 20 elementary schools in Detroit,[2] a project team established that pupil family background neither

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[1]Scott, R., and Walberg, H. "Schools Alone are Insufficient: A Response to Edmonds." Educational Leadership, 1979, 37, 24-27.

[2]Lezotte, L., Edmonds, R., and Ratner, G. Remedy for School Failure to Equitably Deliver Basic Skills. Report submitted to Carnegie Corporation by the Center for Urban Studies, Harvard Graduate School of Education, Cambridge, Massachusetts, 1974.

causes nor precludes elementary school instructional effectiveness.

This conclusion varies substantially from those of the prestigious Equality of Educational Opportunity (EEO) or Coleman report, which concluded that when pupil social class and home background are taken into account, little variation in school achievement can be accounted for by differences in school programs and facilities. The authors of this paper conducted a reanalysis of the EEO, with the design of the reanalysis based on the following premises:

--Schools are not uniformly effective for all pupils who attend them.

--Pupil social class and family background have two aspects: characteristics of the individual student and characteristics of the set of pupils attending a given school. These two aspects must be separated in a statistical analysis of school effectiveness.

--Conclusions about the existence of effective schools should be non-normative.

--Conclusions about school effectiveness are tempered by the performance measure employed.

Methodological procedure employed was to stratify the pupil population (sixth grade pupils in Northern elementary schools tested in the EEO) into a set of criterion subgroups based on race and home background. For each school, mean verbal achievement score was calculated for each of eight subgroups of pupils representing two races and four home-index levels. Schools were then ranked on the basis of the mean performance of the pupils in each subgroup; schools for which the mean achievement of pupils in a given subgroup was above the 75th percentile were considered effective for that subgroup, whereas schools for which the mean performance was below the 25th percentile were considered ineffective. Analyses of the relation of school effectiveness to schools and teacher characteris-

tics were then conducted separately for each of the eight subclasses of pupils previously identified.

The authors discovered through this reanalysis that, indeed, schools were found to be consistently effective or ineffective in teaching subgroups of children. Furthermore, the schools that were instructionally effective for poor and Black children were indistinguishable from the less effective schools on measures of pupil social background. The authors report the following results:

1. There is evidence that schools are consistently effective or ineffective beyond a level that would be expected on a chance basis, and that a school may not be effective for both poor and middle-class children.
2. When an arbitrary competency criterion (completing half of test items on EEOS verbal achievement tests) is used in judging performance, effective schools can be shown to all but eliminate the relationship between family background and pupil performance, at least in the acquisition of the tested school skills to the critical level of competency.
3. When one looks separately at the social class characteristics of schools judged to be effective or ineffective in teaching poor Black pupils, it becomes clear that these two groups of schools are indistinguishable on the basis of social class.
4. In terms of characteristics of effective schools, variables that appear to be consistently related to school effectiveness in teaching poor children are

   --Teachers assigned to school (as opposed to teacher selection of school)

--Teachers hold that a common standard of instruction can be applied to all students

--Students not separated into ability groups

--Few teachers of remedial reading, special mathematics and English courses and fewer guidance counselors

--Special education programs for pupils with certifiable disabilities

--Pupils more likely to have attended kindergarten and nursery school

In explaining the contrast between these conclusions and those based on previous analysis of EEO data, the authors contend that earlier analyses were based on a set of statistical assumptions implicit in the breakdown of overall variance in pupil achievement into two orthogonal components: variance within schools and variance between schools. These assumptions are

1. Regression surfaces are homogeneous for subgroups of the pupil population.
2. Schools that are effective for pupils of one social class are effective for all classes of pupils.

Fowler, W. J., Jr. Effects of School Characteristics upon Achievement Test Scores in New York State. Paper presented at the American Educational Research Association, Boston, 1980.

This study was undertaken to confirm Goodman and Kiesling's earlier findings[1] in New York State that student achievement was positively related to expenditures per pupil, particularly in districts with more than 2000 students. Data from all 705 New York State school districts was analyzed by Fowler.

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[1]Goodman, S. M. The Assessment of School Quality. Albany: The State Education Department of New York, 1959.

Relationships between nine dependent and 15 independent variables were examined. Dependent variables were state PEP tests of reading and mathematics for all districts for grades 3, 6 and 9, the percent of students scoring two years below certain achievement levels for those grade levels, and the average Regent's score for each district. The independent variables of school district characteristics were

--Expenditure per pupil

--Enrollment

--Total professional staff

--Total classroom teachers

--Other professional staff

--Tax rate for education

--Number of teachers with BA

--Number of teachers with BA + 30

--Number of teachers with MA

--Number of teachers with MA + 30

--Number of teachers with doctorate

--Mean-years of teaching experience in district

--Mean-age of teachers in district

--Mean-instructional salaries

--Total state aid per total aidable pupil unit

The procedure used was that the average SES score and previous grade test score were regressed upon the dependent test score of interest. It was hoped that this procedure would permit the assessment of the effects of school characteristics upon median district test scores without the confounding effects of SES and differential native ability cited by previous researchers in school effectiveness.

Overall conclusions generated from study results are

1. The overall findings confirm again the puzzling, inconsistent pattern between achievement test scores and school characteristics, and even demonstrate negative correlations between supposed quality variables (such as expenditures per pupil) and achievement test scores.
2. The results also suggest an interesting hypothesis: that additional expenditures per child and other quality-related measures raise the test scores of the poorest performing students.

Addressing the criticism that production function studies in education have failed to find uniform effects, Fowler observes that this is hardly surprising "given the distal surrogate measures that typically have been utilized, without the ability to adequately separate within school and between school variance" (p. 22). He suggests "a redirection of research on educational effects by both selecting samples to maximize the range of school environment variation and to utilize more sensitive measures" (p. 22) as a first step.

Gage, N. L. The Scientific Basis of the Art of Teaching. New York: Teachers College Press, 1978.

The author establishes that variations within classroom teaching are worth studying and that teaching, especially in its socially interactive forms, must entail some artistry. By "scientific basis" he refers to knowledge of regular, nonchance relationships in the realm of events with which the practice is concerned. For the purposes of this book, the scientific base for the art of teaching consists of two-variable relationships and lower-order interactions. The higher-order interactions between

four and more variables must be handled by the teacher as artist.

In a discussion of related literature, Gage notes that most reviewers have concluded their reports by saying that past work has been essentially fruitless. However, in a great deal of the extant research the error of considering a relationship to be nonexistent when, in fact, it does exist, arises through the following series of circumstances:

--The teaching-learning process is so complex that any single significant variable in teacher behavior should have only a low correlation with student outcomes.

--The studies of teaching are typically based on relatively small numbers of teachers.

--In a sample of 15 teachers, a correlation coefficient of .01 level significance must equal .64.

--Thus, most of the sample studies should not be expected to yield statistically significant results.

Gage proposes to take into account the sample size and magnitude of the relationships or difference through testing the significance of combined results. The technique entails converting the exact probability value of the result of any single study into a value of the statistic called chi square. Then, the significance of the sum of the chi square values are determined. He found significant relationships between teacher indirectness (defined as soliciting the opinion and ideas of pupils, applying and enlarging on those opinions and ideas, praising or encouraging the participation of pupils, and accepting their feelings) and student achievement, between teacher praise and student attitudes, between teacher acceptance of pupil ideas and pupil achievement, and between teacher criticism and disapproval and pupil achievement.

Through a process of sifting the detailed information for several hundred teacher behavior and classroom activity variables, Gage and

colleagues developed a set of inferences regarding how third-grade teachers should work to maximize student achievement:

--Teachers should have a system of rules allowing pupils to attend to personal and procedural needs without having to check with the teacher.

--Teachers should move around the room a lot, monitoring pupils' seatwork and communicating to their pupils an awareness of behavior while attending to academic needs.

--For independent pupil work, teachers should insure that assignments are interesting and worthwhile yet easy enough to be completed by each pupil alone.

--Teachers should keep to a minimum activities such as giving directions and organizing class for instruction.

--Teachers should call on a pupil by name before asking a question as a means of insuring that all pupils are given an equal number of opportunities to answer questions.

--With less academically oriented pupils, teachers should always aim at getting the child to give some kind of response to a question.

--During reading-group instruction, teachers should give a maximal amount of brief feedback and provide fast-paced activities of the "drill" type.

In discussing the field of teacher education, Gage notes that the tools necessary to apply current knowledge of the scientific basis for the art of teaching are relatively well in hand. These tools are being further developed and tested in field programs such as that of the NEA. The main need here is closer coordination between the efforts of the teacher education researchers and the teacher effectiveness researchers. Movement in this direction is evidenced through efforts to use findings of correlational studies in experiements whose effects on both teacher behavior and student achievement and attitude are determined.

The final chapter discusses the problem of improving knowledge of relationships between what teachers do and what students learn. This

problem consists of two overlapping components -- the substantive problems of how to identify more powerful variables and the methodological problems. After a thorough analysis of each of these component problems, Gage concludes that the prospect for research on teaching is that more effective kinds of teacher behavior will gradually emerge from current experiments that have just begun. Some effects of these experiments will be of general value for all teaching, while others will reveal that certain ways of teaching are superior only for certain combinations of grade level, subject matter, and student characteristics. None of the generalizations that survive the test of experimentation are likely to permit highly exact prediction or unerring control of educational results.

Gray, S., Ramsey, B., and Klaus, R. The Early Training Project in Longitudinal Perspective. Paper presented at the meeting of the Society for Research in Child Development, San Francisco, 1979.

In this paper, Gray and colleagues report on some findings from the Early Training Project. Children in this study were born in 1958 and began participation in the project in June 1962. The sample consists of Black children from low-income families in two small cities in the Upper South.

The initial intervention was composed of two delivery systems: a 10-week summer school experience focused mainly on language aptitude and perceptual and cognitive development and on related attitudinal variables such as achievement; identification with achieving role models was stressed. A weekly home visit focusing on the mother was conducted during the first school year, emphasizing the same objectives.

At the end of the first grade, the project children were significantly superior on three of four subtests on the Metropolitan Achievement

Test; a year later, this was true of only two of five tests. Two years later, there were no significant differences between experimental and control groups, although all seven differences were in the predicted direction.

In conducting a followup beginning in 1974, the authors' interest was mainly in doing a descriptive study of "an intrinsically interesting sample during a period in which there was rapid social change" (p. 4). This followup was done as a member of the Consortium on Longitudinal Studies. Overall attrition, 1962-1978, was approximately 25 percent; the attrition was not in the generally predicted direction of the less capable children being lost. Findings on this followup study include

--The experimental treatment has had little residual effect on aptitude and achievement test performance or on the two tests in the affective domain;

--There was no longer a residual treatment effect as indicated on cognitive test scores;

--Though differences between experimental and control group in terms of number of high school graduates and dropout rates are in the predicted direction, they are not significant.

--A much larger percentage of control than experimental children were placed in classes for the educable mentally retarded;

--Though percentage of adolescent pregnancies was similar in these two groups, there were substantially more girls returning to school and graduating after the pregnancy in the experimental group.

In examining these findings, the authors suggest two possible causal factors to explain what appears to be a pattern of effect of early training on school career data. One factor is a pervasive motivational variable

encouraging participants to expend more effort in school, even if test scores are not high, and to find school more congenial to their interests. The other could be called improved social acceptability, at least as perceived by teachers.

In concluding, the authors discuss what the future holds for these young people. Though a few of the more capable may "come a little closer to what we hope for them, and what they hope for themselves" (p. 16), for many of them life courses seem already relatively well set and future options narrowed.

Hanson, R. A., and Schutz, R. E. "A New Look at Schooling Effects from Programmatic Research and Development." In Dale Mann, ed., Making Change Happen? New York: Teachers College Press, 1978.

The authors propose a new approach to the inquiry into school effects that they feel departs "dramatically" from prior research efforts. It originates in the programmatic educational research and development conducted by the Southwest Regional Laboratory for Educational Research and Development (SWRL). The methodology has these features:

1. The use of data from natural school environments drawn from a defined instructional program for a large number of pupils, classes, schools, and districts, carried out over a number of years of schooling
2. A primary set of data-gathering components specifically designed for the instructional program and linked to the operation of the program and the projected research
3. A secondary set of data-gathering components that provide information on specific variables needed for the research
4. A program information service that provides progress reports to

various current and potential audiences, and functions also for obtaining source data for program implementation and pupil performance evaluation

It is felt that the methodology incorporates mechanisms into the natural instructional environment that aid the participants (students, teachers, and administrators) but concurrently provide unique data for understanding instruction and schooling. Because all schools have a common instructional vehicle with known environmental characteristics, the method permits an examination of the impact of the vehicle as well as other attributes on the obtained effects (e.g., teacher grouping practices, class size, student body ethnic-racial composition, instructional time allocation, school/district implementation effort, and so on). Instrumentation accompanying a specific program inquiry is used to measure the most useful attributes. The results for a given attribute are determined by relating its variations across users to variations across program-specific outcome measures. Although this process will produce results applicable to a specific program and user population, it can be generalized by means of such processes as cross-validation, replication, generalization, and extension.

The methodology is described in this article through a summary of the use of the SWRL/Ginn Kindergarten Program nationally beginning in the 1972-73 school year. The Kindergarten Program used in the inquiry was designed to help children learn conceptual skills fundamental to academic achievement (the Instructional Concepts Program) and to master beginning reading skills (the Beginning Reading Program). The authors focus on two aspects of the instrumentation: the Beginning Reading Program and the associated quality assurance components.

--The Beginning Reading Program provides instructional resources to teach three major skills to kindergarten pupils: to read the one hundred words taught directly in the program; to sound out and read new words composed of word elements taught in the program; to comprehend the material read.

--Instructional materials and procedures are presented in ten units, each typically requiring between one to three weeks to complete. After the completion of instruction on each unit, a twenty-item criterion exercise is provided to assess the pupil's learning of letter names, word elements, words, and word attack.

Quality assurance components used to provide the data are

1. Entry Survey: A twenty-two item, individually administered, program-specific reading readiness measure given during the first month of school.
2. Unit Report: Used to record the dates when a teacher began to use a unit, when it was completed, and the scores of pupils on the unit test (criterion exercise).
3. BRP Assessment: A set of forty-three items administered to pupils by their teacher at the completion of instruction with the program or at the end of the school year, whichever occurred first. It provides scores on the four major program outcomes.
4. School Information Sheet: Basic information on biosocial characteristics of pupils at each participating school (e.g., Title I eligibility, percent of ethnic minorities enrolled, etc.).

The 1972-73 and 1973-74 program years were studied. In 1972-73, 2,049 schools and 115,554 students participated; in 1973-74, there were 1,949 schools and 111,485 students. Most schools and students participated in both years. The participating schools and students were fully representative; however, they overrepresented situations that typically display low educational performance patterns.

The results of the Beginning Reading Program made during and after instruction were mixed. Although all users in all biosocial characteristic categories were proficient on the unit tests for units they completed, there was a substantial variability in units completed both across and within the various biosocial characteristic categories. The classes in the "disadvantaged" settings completed fewer units than those in the "advantaged" settings.

It is felt that the differences observed across classes on the sentence reading outcome of the assessment can be explained by the differential instructional completion rate by the classes in various biosocial categories and not just as a function of the differential ability traits of the pupils. If the program were used differently with all the pupils, then the outcome variability would be created by the manipulable feature of the instruction; and not be a fixed characteristic beyond the control of the schools.

In reanalyzing the data from this perspective, Hanson and Schutz conclude that there was a possible and regular relationship between number of units completed and end-of-year proficiency for the total sample of classes, and that it held for groups below and above the national reading median and for the two ethnic minority groups in the sample. They also found that there was a positive relationship between amount of instruction (number of days) and the proficiency attained by the pupils (number of units completed) for the entire sample, in all reading ability and ethnic groups. They also found that the more advantaged the students were prior to receiving instruction, as measured by the entry survey, the more instruction they received (program units). It is felt that the data consistently show that the differences in program performance among various categories

of pupils result from differences in the number of days spent on instruction rather than any differences in effectiveness of instruction on pupils with different biosocial characteristics. Thus, the concept of educational disadvantagement is a creation of conditions under the control of the schools rather than a condition resulting from unchangeable genetic and environmental factors that impede schooling.

It is felt, finally, that the kind of research and development carried out in ecologically natural conditions can be used by school personnel to better understand the effects of schooling in ways that can intervene to manipulate them in their own and their pupils' best interests.

Hanushek, E. "The Production of Education, Teacher Quality and Efficiency." In Do Teachers Make a Difference? A report on recent research on pupil achievement. Washington: U.S. Office of Education, 1970. 35 pp. ED 037 396.

In this paper, Hanushek examines the educational process with the aim of identifying the role of teachers in education. Two attempts at estimating models of education are presented: one relying on the data from the Equality of Educational Opportunity study, the second using a sample collected from a California school system in 1969. The only output measure used in both studies is achievement test scores.

The sample used for one analysis included all urban elementary schools from the Northeast and Great Lakes regions of the EEO survey that had at least five White or Black sixth graders. Models of education for Whites and Blacks were estimated using regression techniques. Several measures of teacher quality proved significant for both Black and White subsamples in the models. One of these is teacher experience, a variable that can be explicitly purchased by schools.

The best measure of teacher quality contained in the data is teacher verbal test score, which probably acts as a partial proxy for general intelligence. However, many teaching dimensions, such as rapport with the class, empathy, warmth, knowledge of subject matter, which are probably valuable in teaching, are not included in this measure. The final teacher quality measure is the percentage of sixth graders who had a nonwhite teacher during the last year. This is interpreted as a measure of part of the teacher quality distribution, i.e., the lower end of the distribution, reflecting the inferior education received by Black teachers.

School factors that proved insignificant in modeling the educational process are teacher degree level, sex, age, teaching certificates, attitudes toward teaching and students, measures of teacher background, and class size.

For third-grade students in a large California school system, SAT scores and family background information were collected. Information was also collected on teacher background, attitudes, and specific aspects of schooling. Students were eliminated if both first- and third-grade achievement test scores were unavailable or if sample data was not available on both second- and third-grade teachers. The final sample consisted of 1061 students who were divided into White, manual occupation; White, nonmanual occupation; and Mexican American, manual occupation subsamples for analytic purposes.

In this analysis, teacher characteristics affecting achievement are verbal facility test scores and length of time since most recent educational experience. These teacher characteristics were more important for the White, manual occupation subsample than for the White nonmanual. None of the measurable factors used in this analysis concerning teachers had an

impact on the reading achievement of Mexican American children.

Hanushek believes that, though each of these analyses is associated with a set of problems that tend to dilute findings, the sum of the two provides a more reliable picture of education from which conclusions can be drawn. The strongest such conclusion is that school systems now operate quite inefficiently; they are buying some of the wrong teacher attributes, e.g., advanced education, which lead to little or no achievement gains.

Heflin, J. P. Prevailing Models for Describing and Analyzing the Phenomenon of Black School Failure. Paper presented at the meeting of the American Educational Research Association, San Francisco, 1979.

In response to several studies that document that Black pupils perform less well in school than White counterparts, Heflin examined eight social-psychological models that have been utilized to describe and analyze the phenomenon of Black school "failure." These models, based on social-psychological theories, have been advanced in recent years to guide educational policy and programming.

The assumptions and program implications of these models, divided into two main categories, are

Child Deficit Category

Cultural Deficit Model: Black children have had fewer meaningful experiences than Whites and are at a disadvantage in readiness for public school. School programs should stress remedial prescriptions in order to allow them to catch up with other children.

Genetic Difference Model: Blacks do not perform as well because they have inferior genetic endowments for certain cognitive tasks. As a result, educators should not continue to design compensatory and other

enrichment educational programs.

PUSH/EXCEL Model: Blacks perform less well than Whites because of spiritual deficiencies and less than optimum motivation, care, discipline, and chastisement. The child should be enclosed in a triangle including home, church, and school, and more effective motivation and discipline strategies should be implemented.

Institutional (Social Structure) Deficit Category

Cultural Difference Model: Black children do not have a deficit but they differ from White children and do not embrace the dominant values of the school. Educational programs should develop structures, procedures, and curriculum based on a policy of cultural pluralism.

School-as-a-Failure Model: The school is unable or unwilling to draw upon the Black child's own cultural milieu and value bases. Educators need to understand the major sub-cultures served by the school and to be re-trained for greater awareness and knowledge of the child's cultural milieu.

Social Structural Model: Parents and students, as social actors, behave according to societal demands and expectations and the way in which they have been socialized. Educators, therefore, must adapt a revisionist psychology and become advocates of social and educational change.

Unequal Educational Opportunity Model: Since Black children have had fewer opportunities for equal opportunity, they perform less well on academic work. Therefore, Black children must be given access to the same schools as White students and the educational outcomes for the two groups should be comparable.

Cultural Dominance Model: Blacks perform less well because educators

find it difficult to deal with the oppression in society in the educational area. Teachers and students must engage in a search for the truth and refrain from manipulation of the truth in order to perpetuate cultural domination (race aggression) or advantage.

Following this review, Heflin suggests that Black school failure and occupational records in adult life are dictated more by "cultural oppression" and barriers of the American caste system. In order to become more responsive to Black students, educational institutions must also launch an attack against oppressive structures in the larger society.

Kean, M. H., et al. What Works in Reading? (Summary of Joint School District/Federal Reserve Bank Study). Unpublished manuscript, the School District of Philadelphia, Office of Research and Evaluation, 1979. 67 pp. ED 176 216.

This study explores the issue of fourth-grade reading achievement growth as measured by changes in standardized test scores. Findings are interpreted in a broad, directional manner to indicate the positive or negative effect of only the robust findings, not to suggest that we know precisely how much reading scores can be altered by adjusting a given input by a specified amount.

The School District of Philadelphia's Office of Research and Evaluation and the Federal Reserve Bank of Philadelphia's Research Department collaborated in this follow-up study of a 1975 Federal Reserve Bank study (discussed elsewhere in this review) of achievement growth in the Philadelphia schools utilizing econometric techniques. The same methodology was employed, but integrated within it were the concerns and learning priorities of the school district. A major strength of the study is the availability of extensive pupil-specific data on the reading approach; on the way in

which reading instruction was delivered; and on teacher, school, and socio-economic characteristics.

All grade four students in 25 schools were study subjects. Research indicates that this grade is an important point at which to identify trouble since a sharp decline in test scores is frequently observed at this level. The schools are representative of students with high, middle, and low degrees of success in reading achievement in terms of absolute reading level and reading growth. Study instruments included, in addition to a form to efficiently record pupil-specific data from pupil records, were a principal interview, a reading teacher interview, a classroom teacher interview, and a classroom reading aide interview.

The dependent variable was defined as the growth score from third to fourth grade in Achievement Development Scale Score Units for Reading Comprehension on the CAT. The many principal, reading teacher, classroom teacher, school, and student variables collapsed rather neatly into the following five sectors:

student/socioeconomic status

school characteristics

teacher characteristics

instructional support

reading program

The reading approaches included (representing all 12 commercial programs used in the study's 94 fourth-grade classrooms) were Specific Skills Approach, Traditional Basal Approach, Linguistic Basal Approach, and Linguistic Programmed Approach.

The study yielded considerable information about reading. The policy implications listed below are considered the most important by the

authors:

1. Spending more days in school is associated with learning, and attendance records are important measures of program success and implementation.
2. Neither frequency of residential moves nor bussing undertaken to relieve overcrowding is associated with poorer learning.
3. Involvement of elementary school principals in reading, through previous professional training in reading and current observation, is associated with greater learning.
4. The K-7 school format seems most effective for fourth-grade reading development. Also, schools with more supportive staff per pupil are similarly effective.
5. Though low and middle achieving students do better in schools with more high achievers, the contribution that changes in line with this finding might make to fourth-grade reading is clearly very small.
6. Median income of school feeder area, proportion of students from families on AFDC, and proportion of students below the 16th percentile are not accurate flags for predicting fourth-grade learning.
7. More fourth-grade reading growth is associated with more direct contact of student and teacher, and with fewer personal or professional absences taken from teaching time. Very new teachers, it appears, operate to the disadvantage of the fourth-grade reader.
8. Teacher characteristics of experience, extra credits of education, and degrees are not associated with learning.

9. The more time spent on independent reading, the more learning; the Linguistic Basal Approach is associated with more learning growth than the alternatives currently used in Philadelphia; enthusiasm of the teacher for the reading program is beneficial; and when the teacher has more direct contact in teaching reading (uses few aides and deals with more students simultaneously), students learn more.

Klitgaard, R. E.; Hall, G. R. A Statistical Search for Unusually Effective Schools. Report No. R-1210-CC/RC. Santa Monica, California: Rand Corporation, 1973. 86 pp. ED 085 409.

In a reanalysis of six large data sets, Klitgaard and Hall attempted to determine whether some schools consistently produce outstanding students even after allowance is made for the different initial endowments of their students and for chance variation. The six data sets were

1. Michigan schools, 1969-1970 and 1979-1971, grades four and seven.
2. New York City elementary schools, 1967-1971, grades two through six.
3. Project Talent data, 1960, grades nine and twelve.
4. New York State school districts, 1969-1970 and 1970-1971, grades three and six.
5. New York State schools, 1966, grade one; 1968, grade three; and 1971, grade six.
6. Project Yardstick data, many years and grades.

The study utilized regression analysis of achievement data, but since

the researchers were concerned with outliers[1] rather than central tendencies, they did not focus on the regression line and its coefficients, but on the residuals from that line. Since they felt that there is no accepted model of the school variables that affect scholastic or educational performance, and since previous studies have shown that most interschool variation is explained by variation in nonschool factors, they controlled only for nonschool factors like socioeconomic status, minority enrollment, regional variables, and previous test scores. Then they assumed that all residual variation represented the school effects (and random fluctuation). The researchers experimented freely with simple and complicated controls, using different data and different kinds of fits in order not to miss exceptional schools, if they existed.

Three tools of analysis were used to examine the residuals. First, the researchers examined histograms of residuals to discover the presence of extremely overachieving schools and different educational "technologies" among groups of schools. Second, using scores from different grades and years, they compared the number of schools that consistently overachieved with the number expected assuming all residual variation was random. Third, when possible, they contrasted policy-related and background characteristics of the overachieving schools with those of the average school. Differences in policy-related factors would indicate that outliers were indeed not random; but differences in background variables could indicate statistical problems like heteroskedasticity, curvilinearity, or an omitted control.

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[1]In this report the term outliers is used qualitatively to indicate observations of the exceptional in a set data as compared with the data central tendency and overall distribution.

The results can be summarized as follows:

1. The distributions of school achievement scores were always extremely tight, once nonschool background factors were held constant. The histograms of the residuals were uniformly normal-looking, with well behaved tails and no discontinuities. Thus, there was no immediate evidence of extreme overachievers or "gaps" in educational technology.
2. There was evidence of unusually effective schools, however, especially in the 1969-1971 Michigan data. When such schools were identified, they compsoed from 2 to 9 percent of the sample and averaged about 0.4 to 0.6 interstudent standard deviations above the mean, corresponding to an increase from the fiftieth to the sixty-fifth or seventieth percentile. (Because different response and regressor variables were used, the different results are not strictly comparable.) There was also evidence of unusually effective New York districts. Other analyses, notably with Project Talent data, revealed no cutstanding schools apart from those chance alone would allow. No matter how simple the controls and even assuming all residual variation reflected school effectiveness, no school in any data set was consistently able to raise its students' achievement scores more than about 0.8 interstudent standard deviations.
3. Outstanding Michigan schools tended to be rural and White, even after controlling for region and racial composition. Heteroskedasticity was found. After eliminating rural schools from consideration and using a minority enrollment dummy, the top Michigan schools were found to have smaller class sizes, more teachers

with five or more years of experience, and more teachers earning $11,000 or more annually. These results provided strong evidence that such schools were not statistical quirks.

Klitgaard and Hall feel that the policy implications of this report depend on the appropriate scale of magnitude; for example, is half an inter-student standard deviation "a lot?" They discovered schools that were statistically "unusual," but whether they were unusually effective, they suggest, is a question transcending mathematics. Nonetheless, consistently better schools were located that probably deserve in-depth study. They also draw a methodological lesson: researchers should stop studying average effects. For both policy and research purposes, exceptions to the rule may be more important.

Madaus, G., Airasian, P., and Kellaghan, T. School Effectiveness: A Reassessment of the Evidence. New York: McGraw-Hill, 1980.

Much of this book focuses on the limitations of research to date on school effectiveness. The authors decry the tendency to assume that the pessimistic conclusion of the Coleman report (that schools bring little influence to bear upon a child's achievement that is independent of his background and general social context) provides fair representation of what actually takes place in American schools.

Negative inferences about the influence of schools, such as those derived from the Coleman report, are a function of the unit (the school) selected for study, the methodology (stepwise regression) employed, the input variable selected (static, status variables) and, most importantly, the procedures employed to measure "achievement" (standardized norm-referenced, verbal ability, and reading and arithmetic tests).

The authors believe that considerable available evidence casts serious doubt on this pessimistic conclusion regarding school effectiveness, evidence indicating that differences between schools in achievement can be explained by factors related to school and classroom characteristics. For example, Mayeske and colleagues[1] adopted a method that allowed the relationship between school factors and student achievement to be shown without first allocating all shared variance to students' home background, a method that attempts to determine unique contributions of variables to variance as well as the common contributions of sets of variables. Mayeske's reanalyses also constructed criterion measures of school outcome -- an achievement composite based on a factor analysis of five measures including verbal ability -- distinct from that employed in the Coleman report -- the single measure of verbal ability. One effect of these modifications was to demonstrate greater between-school variance than the 10 percent found by Coleman. For example, 37 percent of total variance in the composite measure was associated with the schools attended for ninth-grade students and 34 percent for twelfth-grade students. This reanalysis indicated that the influence of home and school factors acting in consort has an important effect on achievement.

Madaus et al. review other large-scale studies including the International Association for the Evaluation of Educational Achievement projects and evaluations of Head Start and Title I and the Jencks study. They then discuss the complexities involved in the strategies and analytic procedures

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[1]Mayeske, G. W. et al. A Study of Our Nations Schools. DHEW Publication No. (OE) 72-142. Washington, D.C.: U.S. Department of Health, Education and Welfare, 1972.

involved in investigating school effectiveness; in analyzing and measuring school inputs, processes, and resources; and in selecting valid school outcomes, specifically standardized tests of ability and achievement.

Recent research contradicting the overall assessments of the Coleman report is then cited. This work indicated that, when syllabus-specific achievement measures that are important in the minds of teachers and pupils are used, then substantial differences in achievement level between schools and between classes within schools are found. A substantial part of these differences can be explained by differences in the academic press of the school or classroom rather than by home-background factors. Schools or classes that have strong press for academic excellence, value discipline, provide structure, emphasize homework and study, and expect pupils to do well, achieve at higher levels than those that do not subscribe to these values. This is particularly true at the secondary level.

The authors review the conceptual framework of studies of school effectiveness, observing that what has not been learned from recent large-scale studies is perhaps more revealing than what has been learned. For example, nothing has been learned about the absolute effects of schooling nor about the unique character of the home's contribution to student achievement. In addition, it is important to bear in mind that for many school characteristics measured in these studies, slight variations in inputs regarding school expenditure, physical amenities, teacher characteristics, etc., are being discussed.

Doubts are raised on several points regarding the validity of the view of schooling implicit in the Coleman Study. The question of schools' objectives is fundamental; in this context the authors pose the following questions and suggest alternative hypotheses to those implied in many

school effectiveness studies:

1. Do schools strive to achieve equality of educational output?
2. Do schools teach skills measured by standardized tests of ability and attainment?
3. Do schools strive to work independently of students' home background?
4. Do all students share equally the schools resources?

McDonald, F. J., and Elias, P. Beginning Teacher Evaluation Study: Phase II, Executive Summary Report. Princeton: Educational Testing Service, 1976. 167 pp. ED 142 592.

In Phase II of the Beginning Teacher Evaluation Study, a variety of measures was developed and a system was designed to measure teaching performances and pupil learning. The method produced significant correlations between observed teaching performances and the measures of learning. The measurement system developed provided data used to evaluate four kinds of relations:

1. How teaching actions relate to pupil learning
2. How pupils' characteristics relate to their learning
3. How teachers' characteristics relate to how they teach
4. How the environment in which the teachers work affects how they teach

Through a variety of regression analyses relations among these variables were explored.

The eight school districts studied (two urban, three suburban, and three rural) were located in California. Forty-one second-grade and 54 fifth-grade teachers volunteered to participate; 2500 pupils were included in the study. Teachers kept complete diaries in addition to being observed

and videotaped. Principals completed questionnaires and were interviewed. Pupils were tested on achievement in reading and math and on pupil attitudes toward reading and math in the fall and spring; teachers were also tested at these times. Tests to measure pupil achievement were developed specifically for the purposes of this study based on the curriculum goals of the State of California.

The general conclusions relevant to research on teaching are

1. No single teaching skill or performance was found to be equally or comparably effective in both grades in both subjects.
2. There are no single teaching-performance variables correlating so significantly with children's learning that they should be considered critical for effective teaching. Rather, patterns of teaching performances accounted for differences in pupil learning.
3. Teacher effects proved significant in a substantial proportion of the analyses in this study.

Not surprisingly, the factor found to most thoroughly relate to a pupil's final score was initial score, and these initial scores are positively correlated with socioeconomic status. The second most important factor predicting change was teacher actions. These actions affected pupils whose initial scores were low compared to classmates, as well as those who did above average or better on the test.

In Grade Two Reading, the teaching pattern that was most positively correlated with pupil improvement was one in which children were in independent seatwork with teacher interacting through initiation of discussion, explanation, and questions: In this positive pattern, teachers used a greater variety of instructional materials and kept children on-task by

redirecting them to the task.

The two positive predictors for Grade Five Reading instruction were extent to which teacher discussed, explained, questioned, and answered in a sustained fashion and measure of direct individual instruction; negative predictors were use of a diversity of materials and pupil inattentiveness.

The only positive predictor in Grade Two Mathematics was variety and number of mathematical skills taught, while the negative predictors were teaching the class-as-a-whole, using a complex organizational structure, and sustained reactions to pupil activities.

In Grade Five Mathematics, however, modes of instruction that appeared effective were not effective with Grade Two. Positive predictors in these classrooms were varied organizational arrangements, amount of time spent by teacher teaching a group, amount of time spent by teacher teaching the class-as-a-whole, and a form of social control directed to keeping the children on-task.

The authors extract some "rules of thumb" from the results obtained in the various analyses. A theme common in these "rules of thumb" is that, if an organizational context or teaching performance provides for direct instruction, learning is improved. Direct instruction includes (1) a component that explains what is to be learned or models it or elicits its elements by questioning; (2) a component that provides the appropriate conditions for attempting what is to be learned, and (3) a component that provides feedback on how well the child is learning the task. The critical problem is, probably, to what degree teaching practices allow for direct instruction rather than whether a teacher teaches in a group or not. When a particular teacher performance is found to be nonproductive as in teach-

ing the class-as-a-whole in Grade Two Mathematics, it should be examined to find out what is missing from the model of direct instruction.

Medley, D. M. "The Effectiveness of Teachers." In R. L. Peterson and H. J. Walberg, (Eds.), Research on Teaching: Concepts, Findings and Implications. Berkeley: McCutchan, 1979.

The author contends that the impact of research regarding teacher effectiveness on either the evaluation or the training of teachers has been slight and attributes this, in part, to a communication gap and, in part, to the inconsistency and incomprehensibility of much of the research findings to date. He then reviews the history of research into teacher effectiveness, and reports a set of consistent research findings along with implications for improvement of teaching.

The earliest research relating to teacher effectiveness attempted to describe the characteristics of an effective teacher; the output was a list of traits attributed to such teachers. Subsequently, teacher rating scales were used widely in the 1930's to evaluate teachers. All of this research resulted in lists of teacher characteristics perceived as effective; such characteristics were not related to pupil outcomes in the research.

Another line of research was the "methods experiment" in which two or more classes were taught by different methods, with the mean knowledge gains of the classes compared to learn which method was most effective; preservice teachers could then learn the "best" teaching methods. The results of such experiments have tended to be either inconclusive or to contradict results of other methods experiments. In addition, nearly all methods experiments used the pupil rather than the teacher as the unit of analysis.

In "process-product" research, a research method for pinpointing teacher effectiveness has been located. The method employed is the observation of teacher classroom behaviors on random occasions, identifying behaviors that are stable across observations. Teaching style or classroom climate are then related to pupil learning. The development and dissemination of "Interaction Analysis"[1] and the publication of the first Handbook of Research on Teaching[2] contributed to the proliferation of process-product studies. Rosenshine's review of 50 of these studies presented evidence that at least some aspects of teaching style or classroom climate are related to pupil learning.[3] The behavior patterns associated with effective and ineffective teaching included clarity, variability, enthusiasm, task-oriented or businesslike, criticism, teacher indirectness, student opportunity to learn criterion materials, and use of structuring comments. Many of these patterns are modifiable through appropriate training.

More recently, a competency- or performance-based teacher education model has been developed, with the basic assumption that the effective teacher has a larger repertoire of competencies than the ineffective. Competencies are distinguished from the stylistic behavior patterns identified in process-product research in that a competency is used only under certain circumstances. For example, the ability to ask higher-order ques-

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[1]Flanders, N. A. Teacher Influence, Pupil Attitudes, and Achievement. Final Report, Cooperative Research Program Project No. 397. Minneapolis: University of Minnesota, 1960.

[2]Gage, N. L. (Ed.) Handbook of Research on Teaching. Chicago: Rand McNally, 1963.

[3]Rosenshine, B. Teaching Behaviors and Student Achievement. Slough, England: National Foundation for Educational Research in England and Wales, 1971.

tions is a competency; clarity is not. Research in teacher competencies takes account not only of how teachers behave, but when and why they behave as they do.

The author sums up this brief research history by noting that current research in teacher effectiveness involves three variables:

--Measures of teaching effectiveness based on pupil learning

--Measures of teacher behavior derived from systematic observation of classroom interaction

--Information about the teacher's intention or purpose

In an examination of 289 empirical studies of teacher effectiveness, the author applied certain quality criteria in an effort to minimize apparent contradictions and inconsistencies. Only those studies in which teacher effectiveness was measured in terms of student gains over several months were considered valid. Since accurate and objective descriptions of teacher behavior are critical, only those studies employing systematic observation schedules, or others that yielded clear descriptions of teacher behavior were included; rating scales for teachers were not considered adequate in this regard. Evidence of generalizability of findings was the final quality criteria applied. In addition, the author determined that only relationships that demonstrated a minimum overlap in variance of 15 percent, corresponding to a Pearson product-moment correlation coefficient of $\pm$.387, would be considered strong enough indication of teacher effectiveness. From 14 studies, 613 relationships survived all four of these criteria (thus, 95 percent of the studies examined yielded no usable results according to these criteria).

The profile of the effective teacher that emerges from the relationships verified in several different studies is as follows:

Teaching function	Behavior of effective teacher
Maintenance of learning environment	pupil behavior less deviant and disruptive fewer teacher rebukes less criticism less time spent on classroom management more praise, positive motivation
Use of pupil time	more class time spent in task-related "academic" activities more time spent working with large groups or whole class small groups of pupils work independently less of the time less independent seatwork
Method of instruction	more "low-level" questions less likely to amplify, discuss, or use pupil answers fewer pupil-initiated questions and comments less feedback on pupil questions more attention to pupils when they are working independently

Medley notes the disturbing findings from one study that indicate that behaviors found to be effective with low socioeconomic status pupils were ineffective with high socioeconomic status pupils and vice versa.

In conclusion, the author states that teacher education, both at preservice and in-service level, should adopt the fundamental goal of development of the competencies needed to create and maintain the learning environment, to engage pupils in learning-related activities, and to implement the kind of instruction indicated by research to be effective. He observes that teacher educators have lacked the conviction that these things are what teachers ought to be doing. The important conclusion for research in teacher effectiveness is that future research should build on past findings and look for other ways to increase teacher effectiveness.

Murnane, R. J. Interpreting the Evidence on School Effectiveness. (Working Paper 830). Yale University, Institution for Social and Policy Studies, 1980.

In this essay, Murnane provides an interpretation of school effectiveness research which both explains puzzles in the empirical findings and provides a coherent perspective from which to ask new research and policy questions.

Quantitative studies of school effectiveness are reviewed and analyzed. Murnane observes that these studies indicate that there are significant differences in the amount of learning occurring in different schools and in different classrooms within the same school even when prior skills and backgrounds of children are considered. Additional findings taken from this review are

--Some teacher attributes are related to student achievement; attributes identified to date are intellectual skills as measured by verbal ability test, quality of college attended by teacher, teachers with high expectations for their students, and teachers with some experience. Teachers with master's degrees are no more effective on average than those with only bachelor's degrees.

--The evidence indicates that elementary school children with low initial skill levels who attend schools where average achievement level is relatively high make more progress. There is similar evidence regarding socioeconomic status.

--It appears that children disadvantaged by low achievement or low SES benefited from attending schools with more fortunate students, while the cost to the more fortunate students in terms of decreased achievement was small.

--Though there exists a large volume of research on the impact of class size on student achievement, there is no consensus on this issue. A recent review by Glass and Smith[1] found that average student achievement was much higher in very small classes than in classes with 20 or more, but that average achievement in classes with 20 students was only marginally higher than in classes with

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[1]Glass, G. V., and Smith, M. L. Meta-Analysis of Research on the Relationship of Class-Size and Achievement. San Francisco: Far West Laboratory for Educational Research and Development, 1978.

30 or 40 students. Murnane points out the limitations in the current research strategies to capture salient aspects of the education process.

--Physical resources available in a school in a particular year are not systematically related to the achievement of the students in that year.

--The technical characteristics of instructional strategies and curricula are not, by themselves, critical components. Instead, what matters is the extent to which teachers are willing and able to adapt the curricula or instructional strategy to their needs and the needs of their students.

The author believes that the main school resources -- teachers and students -- will respond to any changes in the institutional rules, customs, or contract provisions that determine the allocation of resources; the nature of the responses will depend on the priorities and opportunities of these key factors.

Better data and more research will help to learn more about the relationships between school resources and student achievement in ongoing educational systems, Murnane concludes. However, quantitative research on school effectiveness, as currently conducted, will not provide reliable information about the effects of changes in resources on student achievement, since the methodology does not address the question of how resources are allocated in ongoing systems.

A central problem in improving schools is the development of mechanisms for incorporating into the decision-making process information about the priorities of the key factors and, consequently, about their likely behavioral responses.

Rist, R. C. "Student Social Class and Teacher Expectations: The Self-Fulfilling Prophecy in Ghetto Education." Harvard Educational Review, 1970, 40 (3), 411-451.

In this paper, Rist proposes to explore "the process whereby expecta-

tions and social interactions give rise to the social organization of the school or class" (p. 412). One of his primary goals is to analyze the relationship between the teacher's initial expectations regarding potential student academic performance and the student's chance for success within the school system. Through a "microethnographic" classroom observation technique, Rist provides an analysis both of the critical factors in the teacher's development of such expectations and of the process by which these expectations affect the classroom experience of teacher and students.

The data for this longitudinal study were collected by means of twice-weekly one and one-half hour observations of a single group of Black children in an urban ghetto school who began kindergarten in September 1967. These formal observations were conducted throughout the 1967 school year and again in 1969 when the children were in the first half of their second-grade year; four informal classroom visits were made during the children's first-grade year. Additionally, a series of interviews was conducted with both the kindergarten and the second-grade teachers. The school is located in an area with a 90 percent Black population; at the time of the study approximately 55 percent of school students came from families receiving Aid to Dependent Children funds. All school administrators, teachers, staff, and pupils were Black.

The sources of information on the children available to the kindergarten teacher prior to the academic year are reviewed; all four sources concerned social information and none related directly to a child's academic potential. Rist then goes on to analyze the teacher's organization of the classroom on the eighth day of school into three tables. He observed the following criteria differentiating the children at these

three tables: physical appearance and body odor, interactional behavior, use of language, and social factors (income, education, family size) known to the teacher prior to the academic year. The teacher observed that the Table 1 children were "fast learners" while children at Tables 2 and 3 "had no idea of what was going on in the classroom."

In the absence of formal testing of the children, Rist believes that the teacher based her criteria of "fast-learner" on her concept of the characteristics of a "successful child." This particular teacher stressed the characteristics of a high degree of verbalization in Standard American English; ability to become a leader; neat and clean appearance; member of a family that is educated, employed, living together, and interested in the child; and the ability to participate well as a member of a group. Rist then proceeds to provide examples of the process by which "this fundamental division of the class into those expected to learn and those expected not to permeated the teacher's orientation" (p. 423).

In responding to the stimuli of the teacher, the student responses were highly dependent on whether they sat at Table 1 or the other two tables. Rist observed that Table 2 and 3 children did grasp much material through "secondary learning" or mediation of peers and listening to the teacher speak to other pupils, but that the patterns of interaction established by the teacher inhibited the low-status children from verbalizing this knowledge. Also documented are the process by which Table 1 children learned to direct ridicule and belittlement towards children at Tables 2 and 3 and the physical and/or psychological withdrawal of some of the Table 2 and 3 children.

In the first and second grades, this process of dividing the class

into reading groups was based on the differentials of past performance. Within the classroom, the various teachers established a clear system of segregation between the "fast learners" and the "slow learners," and related differently to these two groups.

In order to observe more closely the reward-punishment pattern in the second grade, the author developed a mechanism for evaluating the varieties of teacher behavior (verbal and non-verbal) on a supportive-neutral-control scale. Though neutral behavior accounted for the largest percentage of observed teacher behaviors, this analysis yielded the following picture:

> --Between two and five times as much control-oriented behavior is directed at the lowest, as opposed to the highest, reading group.
>
> --Whereas the combination of neutral and supportive behavior never dropped below 93 percent (of total behavior) with the "fast group," the lowest figure for the "middle group" was 86 percent and for the "slow group" 73 percent.

The "slow learners" (overwhelmingly those of lower socioeconomic class) were, in numerous ways, informed of their lower status and socialized for a role of lowered self expectations and of respect and deference towards those of higher status. Rist notes that the results of his observations indicate that "the school strongly shares in the complicity of maintaining the organizational perpetuation of poverty and unequal opportunity" (p. 447).

Rosenshine, B. "Classroom Instruction." In N. L. Gage (Ed.), The Psychology of Teaching Methods. Chicago: National Society for the Study of Education, 1976, 335-71.

In this chapter, Rosenshine describes some of the major recent studies in the area of classroom instruction and their results, beginning

with a summary of major publications since 1970. He then moves on to review results on six variables of particular interest: time spent, content covered, work groupings, teacher questions, child responses, and adult feedback.

Attention is given to recent studies on instruction for elementary school pupils from low socioeconomic backgrounds. Three classroom studies, all completed in 1974, receive special consideration due to size and breadth; all are based on observations of primary-grade classrooms with low socioeconomic status children and use outcome measures in reading and mathematics. The Follow Through and Planned Variation programs provides the setting for two of these studies.[1] In the other study, Brophy and Evertson spent two years observing primary-grade teachers who had been identified as consistent in their effects upon student achievement across four years.[2]

From these studies, an instructional pattern labeled direct instruction is described. In summarizing this effort to extend the previous review of relationships between classroom teaching variables and student achievement, Rosenshine concludes that if one limits the generalization to primary level low socioeconomic status classrooms in reading and mathematics, and if one gives strong weight to the Follow Through study by

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[1]Stallings, J. A., and Kaskowitz, D. H. Follow Through Classroom Observation Evaluation - 1972-1973. Menlo Park, California: Stanford Research Institute, 1974; Soar, Robert S. Follow Through Classroom Process Measurement and Pupil Growth (1970-1971): Final Report. Gainesville, Florida: College of Education, University of Florida, 1975.

[2]Brophy, J. E., and Evertson, C. M. Process-Product Correlations in the Texas Teacher Effectiveness Study: Final Report. Austin, Texas: University of Texas, 1974.

Stallings and Kaskowitz, several generalizations emerge:

1. Time spent on reading and mathematics instruction and using reading and mathematics materials was positively related to achievement.
2. Time spent by students working alone was unusually negatively related to achievement. Small groups and groups of eight or more students were most functional.
3. A drill pattern consisting of questions that students could answer, followed by feedback and subsequent questions, was most functional. There were no clear results regarding various types of questions or types of teacher responses.
4. A pattern of direct instruction, consisting of small steps at the student's level and a great deal of work mediated by either teacher or workbooks, all directed by the teacher, appeared most functional.
5. The use of a "planned variation" program for classroom research appears promising. This program, however, amounts to much more than installing four or five different methods and collecting observations and outcomes. They have been supervised by national sponsors, and many of these sponsors have had to work a number of years before their sites achieved adequate implementation of intended teaching methods. The three studies reviewed here all represent progressive and fruitful development of the approach that combines both curriculum implementation and observational research.
6. The task of determining which kind of achievement-related variable has which kind of relationship -- causal or noncausal --

calls for analytic experiments in which several variables are manipulated independently of one another. Until such experiments are performed, we shall not know whether, for example, working with large groups is itself desirable or merely correlate, positively with achievement because it is tied to an intensive, structured pattern of teaching that itself makes the desirable difference.

Rutter, M., et al. Fifteen Thousand Hours. Cambridge: Harvard University Press, 1979.

In a longitudinal study of twelve London secondary schools, conducted from 1970 to 1974, the authors discovered a pattern of variation among schools in student learning and behavior, even when social background was held constant. The character of a school as a social institution appeared to be strongly related to the dimensions of student performance on academic achievement tests, student conduct in school, attendance rates, and delinquent behavior outside of school. Such schools had effective educational strategies, were committed to student learning, created a climate of high expectations and respect for students, and provided a pleasant physical environment.

Effective teaching strategies were also pinpointed in the research, including the use of praise, rewards, and appreciation, with immediacy of praise enhancing effectiveness. Teachers in the successful schools spent more time interacting with the entire class. In addition, schools with an agreed upon standard of behavior and discipline functioned better. Teachers in such schools tended to begin lessons on time, not to end classes early, to assign homework to students and to spend minimal class time preparing equipment or distributing materials. These teachers also expected

students to be able to work silently and independently.

Students in the successful schools used the school library more frequently. In such schools, students were more likely to hold responsibilities as group captains or participants in student assemblies. Confidence in students was also manifested through the amount of student work displayed within classrooms and throughout the building.

Rutter et al. indicate that a student's sense of well-being and success in examinations is enhanced by aspects of school atmosphere such as freedom to use building during breaks and lunch periods, access to a telephone, and availability of hot drinks. Field trips were correlated with examination success but extracurricular activities and clubs were not. Where students reported feeling comfortable discussing personal problems with teaching staff, attendance and academic attainment were better, and where teachers said they would see children about a problem at any time, pupils were better behaved.

These characteristics of successful schools were not related to age of school building or other physical attributes.

The results of this study, which suggest that teachers and schools do have a significant effect on student outcomes, conflict with the frequently-cited findings in the Coleman report and in Jencks et al.[1] This conflict can be explained by the differing units of analysis, sample, design, methods of data collection and measures of key variables. For

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[1]Jencks, C. S., et al. Inequality: A Reassessment of the Effects of Family and Schooling in America. New York: Basic Books, 1972.

Coleman, the unit of analysis was the individual child whereas for Rutter et al. it was the school. While Coleman's survey was conducted at a single point in time, Rutter and colleagues conducted measures over time, enabling them to analyze what happened to similar children who attended different schools.

Coleman's data obtained from a mailed questionnaire was based on self-reports by students and school administrators, whereas Rutter et al. supplemented such self-reports with extensive reports by trained observers.

The outcome measures used in the London study were (1) attendance; (2) school behavior--truancy, tardiness, damage and graffiti, violence, classroom disruptions, incomplete homework, being out of uniform; (3) success in the curriculum-based public examinations taken at the end of the fifth year by students in the top 60 percent academically; (4) student employment one year after leaving school; and (5) levels of delinquency outside of school, whereas Coleman and Jencks all focused on academic achievement as measured by standardized tests.

The authors contend that secondary schools, as relatively self-contained organizations, tend to develop their own culture, pattern or ethos. This belief is strengthened by research results indicating that the combined effect of school process measures on the four types of pupil outcome was more powerful than any individual factor considered on its own. The results of this study demonstrate the value of viewing schools as social organizations, and imply that teachers and administrators could benefit from knowledge of the process by which social and organizational features shape educational outcomes.

Smith, M. L., and Glass, G. V. Relationship of Class-Size to Classroom Processes, Teacher Satisfaction and Pupil Affect: A Meta-Analysis. San Francisco: The Far West Laboratory of Educational Research and Development, 1979.

This study is a companion piece to the authors' earlier meta-analysis of the effect of class size on achievement.[1] In the earlier study, it was shown that more than 30 percentile ranks exist between the achievement of a pupil taught individually and a pupil taught in a class of 40. In this study, the difference in the quality of the educational environment (a composite of the variables related to quality of education) present in classes of varying size is examined.

Approximately 130 documents fit the authors' selection criteria, which were

--Experimenter must have compared effects of classes of two or more different sizes

--Results must have been presented in some quantified or statistical form

--Study must have been conducted in some educational or quasi-educational setting

A substantial effect of varying class size on teachers was found. The difference in a teacher's workload, attitudes about students, morale, and general satisfaction varies from the 50th percentile in a class of 30 pupils to the 76th percentile in a class of 15. The difference in teacher effects in a class of 10 versus a class of 40 is 49 percentile ranks. Thus the teachers' feeling they perform better in smaller classes is given empirical support.

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[1]Glass, G. V. and Smith, M. L. Meta-analysis of Research on the Relationship of Class Size and Achievement. San Francisco: The Far West Laboratory for Educational Research and Development, 1978.

Though the effects are not as dramatic as those for teachers, the affective impact of class size on pupils is also positive. Difference in pupils' attitudes toward school, interest in the subject matter, classroom behavior, etc., is 14 percentile ranks between classes of size 15 and 40. In other words, a student at the 50th percentile in affective attainment in a class of 30 would be expected to rise to the 70th percentile in a class of 10. Class size does have an effect on pupils' attitudes, interests, and opinions.

The effect of class size on instructional processes and environments is the same as that on pupil effect discussed above. Opportunities for individualization, varied and adaptive learning activities, social interaction, and friendly relationships are greater in the smaller classes. Classes vary on this effect between the 70th percentile in a class of 10 pupils to the 45th percentile in a class of 40 pupils.

These effects were greatest for pupils 12 years and under, somewhat reduced for pupils 13 to 17, and least for pupils 18 and over.

Some features of the study interacted with class-size effect in that well-controlled studies produced slightly smaller class-size effects than uncontrolled studies. However, this difference in effects produced between the two sets of studies amounts to only about 10 percentile ranks even at the extreme points of the class-size scale.

Summers, A. A., and Wolfe, B. L. "Which School Resources Help Learning? Efficiency and Equity in Philadelphia Public Schools." IRCD Bulletin, 1976, 11, 1-15. 17 pp. ED 139 847.

The Research Department of the Federal Reserve Bank of Philadelphia studied a sample of Philadelphia public school elementary, junior and

senior high school students using growth in achievement as a yardstick for measuring the output of the educational process, and then examined the impact of variations in a large number of inputs on that output. The pupil histories constructed provided a richer data base than that obtained in many similar studies: pupil histories were extremely detailed, students were followed over time, the number of schools covered was large, and individual pupils were matched with teachers and the characteristics of those teachers.

Research methods were selected to address the question of interaction between school input and type of pupil. It was found that, for many school resources, the effect on some types of students is very different -- and, frequently, in the opposite direction from the effect on other types of students. The study's important findings are summarized as follows:

--All types of students at all levels of schooling experience larger rates of growth in achievement if they are attending more, and if unexcused absences and lateness are minimized.

--All types of students in elementary school do better if they are taught by teachers who graduated from higher-rated colleges, if they are in a school with a 40 to 60 percent Black student body, if they are in classes of 33 or less, and if they are in a school with more high achievers.

--All types of students in junior high school do better if they are in a school that is part of an elementary school, if they have social studies teachers who graduated from higher-rated colleges, if they have mathematics teachers who were trained in the New Math era, if they are in classes of 31 or less and in a school with more high achievers.

--All types of students in senior high school do better if they are in smaller schools where dropouts are less of a problem.

--Black students with high IQs would benefit if home and school would allow them to achieve as much as non-Black students with the same high IQ especially in the early grades. Black students perform better in smaller elementary schools and in junior highs with larger Black populations.

--Low-income students respond particularly well to elementary school teachers who graduated from higher-rated colleges and to junior high classes smaller than 32.

--Low-achieving students are particularly responsive to certain school inputs. In elementary school, low achievers do better if they are in classes with fewer than 28 students, if they have new teachers, and if they are in schools with more high achievers. In junior high this group performs better with new English teachers and with more high achievers in the school. In senior high the low achievers respond to English classes that have less than 27 students and to smaller schools.

--High achievers do best with experienced elementary school teachers and junior high English teachers, junior high social studies teachers from higher-rated colleges, more library books, and with senior high English teachers with higher English exam scores.

The study finding that school resources influence learning growth has several important policy implications, which the authors point out:

1. Public school resources can be used to attain greater equity in educational opportunity.
2. Shifting resources toward those school inputs which produce greater achievement growth could generate a larger educational output without raising school district expenditures.
3. If specific school resources can be tied to learning, then taxpayers, parents, and courts can hold school administrators accountable.

Tinto, V. "Does Schooling Matter? A Retrospective Assessment." In L. S. Shulman (Ed.), Review of Research in Education. Itasca, Ill.: F. E. Peacock and the American Educational Research Association, 1977.

In this brief review, Tinto attempts to assess the current state of knowledge regarding the effect of schooling on social attainment. Available evidence suggests that the acquisition of educational credentials is more closely associated with the individual's ability to gain access to

high-status occupations than with the ability to do well in the occupation entered.

A sociological overview is presented in which education is tied into the wider system of social stratefication in society. Education has been a prime concern to those who study social stratification due to its presumed impact on this process. It can be viewed as leading to the acquisition of skills appropriate to the performance of a variety of adult roles or as an institutionalized part of the opportunity structure of society serving as a certifying agency to sponsor selected graduates into the more desirable statuses in society. Past research clarly indicates that educational attainment is more closely associated with measures of occupational prestige than it is with measures of income.

A number of large-scale survey studies of social attainment show that educational attainment is the single most important measurable determinant of the occupational status of a person's first job. In addition, recent evidence suggests that the returns of occupational status to schooling have increased somewhat relative to social background factors since 1962. However, all groups do not realize similar occupational status returns for their investment in schooling. Studies reveal differences in Black and White patterns of both educational and early occupational attainment. Though discrimination against Blacks still exists, it is apparent that as a group, Blacks have somewhat closed the gap between themselves and Whites; Black patterns of educational and occupational attainment still differ significantly from those of Whites.

Regarding access to jobs, only among high-status occupations do educational institutions appear to act as sponsoring agencies to promote selected individuals to status positions. These institutional effects

appear more as latent capacities that able and motivated persons of a variety of social origins can activate for their own personal advancement. The research does not support the position that ability and "luck" are the most important factors in status attainment; performance counts, but college quality matters in the attainment of high-status occupations.

Tinto concludes that we cannot assume that we will ever be able to explain, through the application of relatively simple models of attainment, most of the variance in adult occupational status. Present models of status attainment are based on the assumption that most people evaluate potential outcomes of education in very much the same way, and such evaluations are in some simple manner directly associated with social status background. Although the inaccuracy of this assumption has been pointed out, we have yet to see a thorough application of social models of decision theory to the study of education and social attainment. This type of application is likely to reveal important linkages between the family, the school, and other important socializing contexts and the manner in which educational attainment impacts on social status attainment of differing individuals and groups.

Venezky, R. and Winfield, L. Schools that Succeed beyond Expectations in Teaching Reading. Unpublished manuscript, University of Delaware, 1979. See also Venezky, R., and Winfield, L. Schools that Succeed Beyond Expectations in Teaching. Studies in Education. Technical Report No. 1. Newark, Delaware: University of Delaware, 1979. 52 pp. ED 177 484.

The authors studied several public elementary schools that drew their students from low SES areas and that succeeded in teaching reading. Through interviews, analyses of test scores and work logs, classroom observation, and review of school memos, a composite picture of each school

was drawn on which the authors based some generalizations regarding school success. In one Eastern industrial city, another elementary school was studied which appeared to be quite similar to the "successful" school, but which had little to no gains in reading scores.

The study's general conclusions, which will be discussed in more detail below, are that "for schools that draw their students from low SES areas to succeed in teaching reading, strong building-wide curricular leadership is required. This leadership, which, if it exists, usually comes from the principal, must be openly and obviously achievement-oriented. Then, given strong, achievement-oriented leadership, the degree of success in reading instruction will be determined by the instructional efficiency of the school, which is a function of the adaptability and consistency of instruction" (pp. 4-5).

In discussing leadership styles, the authors maintain that, on a continuum stretching from task-oriented to human relations-oriented, task (or achievement) orientation is the primary trait required of a building leader. This means that the principal (or, in rare cases, other leader) has a strong desire to have high reading scores and transmits this desire to staff, parents, and pupils. Though a capable principal can stress achievement while maintaining good relations with staff, parents, and pupils, the authors observed that a primary orientation toward human relations often excluded an emphasis on achievement. Findings from a number of school studies reinforce this view.

In this study of successful schools, the instructional variables that related most directly to instructional efficiency were adaptability and consistency of instruction. By adaptability of instruction is meant

degree to which each student is receiving instruction that he or she needs. (Though "individualization of instruction" is often applied to his idea, the authors find this phrase to be ambiguous, occasionally denoting the impractical or the impossible.) In general, successful schools were found to strongly emphasize homogeneous grouping for reading and careful monitoring of student progress. In such schools, extra personnel involved with reading reinforce reading instruction and there is coordination of all school personnel, particularly reading specialists and librarians. Instruction that meets all of these requirements may still be inefficient if instructional programs are changed frequently or if students are confronted with widely different programs at each grade level.

Venezky and Winfield conclude with specific suggestions for school districts to improve reading instruction as follows:

1. Curricular leadership should be built into evaluation criteria for principals. Required activities here include frequent meetings with lead reading teachers or specialists, coordination of plans for the reading staff, and periodic monitoring of student progress.
2. Inservice classes should be given for principals to teach them different approaches to the responsibilities listed above (No. 1) and about reading in general.
3. Schools should be required to adopt two to three year plans for making their reading instruction more efficient; such plans should attend to grade-to-grade transitions, grouping, assessment, record keeping, and reporting.
4. Schools and school districts should be made more aware of the

programs in other schools that succeed in teaching reading. "There is nothing wrong with reinventing the wheel if one's interest is in invention...for reading, however, we should opt for the 'wheel' category" (p. 38).

Walberg, H. (Ed.). Educational Environments and Effects: Evaluation, Policy and Productivity. Berkeley: McCutchan, 1970.

In this collection of twenty articles, the editor brings together a variety of exemplary analyses in evaluation and research which share the traits of explicitness about the evidence; a causal approach to the analysis; and relevance to educational evaluation, policy, and productivity. Authors were requested to make clear the assumed causal relations among variables and, from these relations, determine how education might be improved. The general conclusions of each author are presented here under the five categories by the editor.

Home Environment. Marjoribanks demonstrates the immense importance of the parental role in children's learning and suggests that school-based programs for parent education be encouraged and that they be firmly based on accumulated research. Mothers and teachers, caught in devalued roles in our society, are asked to raise children in the service of individualistic and competitive goals they do not share, maintains Lightfoot; she believes that only a profound redefinition of cultural norms will establish productive relationships and satisfying lives for those playing socializing roles. Gordon reviews the effects of television on learning as well as its specific impact on outcomes such as aggression, prosocial behavior, passivity, and cognitive development, concluding with a number of ways in which parents and teachers can use television more effectively to promote

learning and to encourage positive attitudes and behaviors.

Sociopsychological Environments. In reviewing the history, scope, and current status of work in this field, Moos concludes that the dimensions of relationships, personal growth or goal orientation, and system maintenance and change, characterize classrooms, and that these constructs and measures of them can provide an empirical basis for sociopsychological diagnosis and educational intervention. Johnson and Johnson believe that the ways teachers set goals and students interact with each other during instruction exert powerful effects on learning and socialization and suggest ways that structures conducive to learning may be readily implemented in school classes. In a summary of fourteen experimental studies of student teams in which members cooperate with one another but compete as teams, Slavin and DeVries find a number of positive relations between team learning and achievement, mutual concern, and intergroup relations and friendships. Using a theoretical model of school organization, Ellett and Walberg trace the empirical correlations of principal competencies, teaching staff morale, competency-based assessment and training programs, the social environment of classes, and learning outcomes.

Instructional Environments. Welch, analyzing changes in sample schools in fifteen states over a four-year period, finds increases in formality, organization, and goal direction accompanied by increased student satisfaction. In a survey of research on student perceptions in different subjects, Kuert finds a threefold curriculum typology with implications for curriculum adaptations: a convergence-divergence dimension distinguishes mathematics and English, a substance-syntax dimension separates science and social studies from math and English, and an objec-

tivity-subjectivity dimension characterizes the differences between science and social studies. Power and Tisher document the effects on student perceptions and classroom behavior of innovative science curriculum materials in Australian schools; they find sharp changes in cohesiveness, diversity, goal direction, humor, fact stating, and materials usage. Another Australian sample is used by Fraser to determine the relative weights of aptitude, instruction, environment and their interactions on outcomes such as interpreting information, critical thinking, and attitudes toward science and inquiry; though aptitude and social environment carry great weight, environmental measures reveal important differences in student perceptions.

Cort also finds that, though student aptitude carries the greatest weight in accounting for outcomes, environmental and course effects are significant, in observing the classroom effects of a National Science Foundation-sponsored middle-school course. Coles and Shalopsky, in reporting on a three-year study of 30,000 students, find that test performance of students is not consistently related to innovative practices but is related to time spent by students on the subject and to teacher qualifications. In a review of the literature on "open classrooms," Horwitz concludes that, on criteria such as academic achievement, self-concept, curiosity, and creativity, the results suggest that open programs are more beneficial, though there are some mixed results regarding the differences between open and traditional classrooms. Another analysis of open schools done by Epstein and McPortland, indicates that, though students in open schools are found to be slightly more self-reliant and positive in their attitude toward teachers, there is no difference between groups in terms of academic performance.

Macroenvironments. In an analysis of the International Study of Educational Achievement data for the U.S.A., Wolf finds that home background and instructional time prove to be the strongest, most consistent correlates of achievement, but that a number of other measures, such as learning environment, are educationally significant. Levine, Kukuk and Meyer, analyzing the relation of poverty indexes and middle-grade reading achievement in six urban areas, find that most of the variance in achievement can be accounted for by neighborhood socioeconomic and poverty indexes, but "percentage of black households in the neighborhood" has little effect on school achievement. Walberg and Rasher, in a study relating percentage of failure on the military draft test to population and education indexes, find that those states with lower socioeconomic status and higher percentages of minority group members tend to have poorer educational services, and that larger pupil-teacher ratios are associated with higher test failures.

Research Methods. McPartland and Karweit deal with two general methodological issues: the limited range of natural variation in school environments and the problem of separating school from nonschool effects; the authors set forth a number of design and analytic techniques to assist educational researchers in overcoming the problem of confounding and limited variation in searching for effects. In describing a causal-modeling approach to the analysis of the effects of programs designed to help teachers improve classroom environments for learning, Murray and Smith suggest the importance of factors such as biographical characteristics, training variables, attitudinal gains, and classroom impacts; they also show how researchers and practitioners can work together.

Wang, Ming-mei. Evaluating the Effectiveness of Compensatory Education. Paper presented at the American Educational Research Association, Boston, April 1980.

Wang and colelagues analyzed the first year data from the Sustaining Effects Study in order to examine students' educational development during the 1976-77 school year and to evaluate the effects of compensatory education on the achievement growth of participants. In this paper they report findings from these analyses and provide some preliminary results of the longitudinal analyses using the three-year data.

The main finding of the one-year analysis is that during the school year, compensatory education has had consistently positive impacts on achievement growth in reading, primarily at the lower three grades, and in math at all grades. These beneficial effects are not large, and the ways in which the effects come about are not clear.

Wang discusses at length the difficulties in evaluating compensatory education effectiveness, the main one being that we are necessarily dealing with comparisons among groups having large preexisting differences as a result of the policy to serve disadvantaged students. To overcome this difficulty, evaluators now emphasize the use of multiple analysis strategies, along with careful appraisal of the validity of findings from different analyses and the plausibility of rival explanations of the findings. Five categories of evaluation models, reflecting various criteria for effectiveness, are employed in Wang's analyses. The methods are

--Norm-referenced analyses

--Analysis of variance with different comparison groups and different measures of growth

--Analysis of covariance

--Comparison of gains conditional on pretest scores

--Comparison with expected growth approximated by regression-based prediction models

Some of the findings from this analysis are

1. Demonstrable effects of compensatory education on the achievement growth of students in both reading and math, though this finding is more or less dependent on comparison standards and analytic approaches. Supportive evidence for such effects is less clear in reading than in math.
2. More consistently positive compensatory education effects are obtained for programs involving Title I than for other compensatory education programs.
3. In general, there are seldom contradictory findings among different analytical methods. Compensatory education participants, particularly Title I students, have achieved growth exceeding what they would have achieved without it.
4. Compensatory education is more effective in the first grade than in others. Effectiveness of compensatory education tends to drop at the upper three grade levels in reading, but similar phenomenon is not evident in math.
5. Effects of previous exposure to compensatory education on the achievement growth of students do not exhibit a pattern and vary with grades.
6. Evidence for positive effects of special instruction on achievement growth is sparse. The conclusion, then, is that instructional serivces are not primarily responsible for accelerating the achievement growth of compensatory education students. However, a more definitive answer to the question of what determines

achievement growth awaits longitudinal analysis. Further studies concentrating on in-depth classroom observations may also be necessary for better understanding of the role of instructional services.

In a discussion of the preliminary analyses of the three-year data, Wang discusses the methodological problems arising from potential cohort differences, high attrition rates, and practice effects of test taking. Her present study design does not permit sorting out of the dominant factor among these confounding effects on student performance.

Weikart, D., et al. The Ypsilanti Preschool Curriculum Demonstration Project: Preschool Years and Longitudinal Results. (Number 4) Ypsilanti, Michigan: The High/Scope Educational Research Foundation, 1978. 163 pp. ED 156 756.

The Curriculum Demonstration Project was designed to compare the effectiveness, under carefully controlled experimental conditions, of three theoretically distinct approaches to compensatory preschool education. The programs, representing the major approaches to early childhood education in operation during the late 1960s, are

--The Cognitively Oriented Curriculum -- an "open framework" approach based primarily on Piaget's theory that mental growth occurs through children's active exploration and manipulation of their environment

--The Language Training Curriculum -- a "programmed" approach based on the model that views academic problems of disadvantaged children as a result of inadequate language development

--The Unit-Based Curriculum -- a "child centered" approach based on traiditional nursery school programs with focus on social and emotional growth of the child

The study involved 41 children, about equally divided among the three programs; these three- and four-year olds attended preschool for two

years. Noncurriculum variables were carefully controlled so that outcomes could be attributed to program-related effects. The effectiveness of each of the three curricula was examined both concurrently during the two years of the preschool program and longitudinally by following up children through the fourth grade.

Results showed a large overall gain in cognitive development as measured by the Binet, during preschool. Children in all three programs were quite similar to each other on cognitive-linguistic measures at the end of the first year of preschool. Children in the Language Program had significantly higher aptitude scores.

Longitudinal results indicated that the large cognitive gains evident for the group at the end of pre-school were still being maintained five years after the children entered elementary school. There were almost no significant differences between children in the three programs on cognitive measures administered during the first five years of elementary school. Children who participated in the CD project were only half as likely as a comparable group of children who had not attended pre-school.

Weikart et al. discuss the group of pre-school studies, which began about 1968, examining the effects of different pre-school curricula on children. Major studies in this group discussed are the Karnes study at the University of Illinois[1]; Miller and Dyer's study on public schools in

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[1]Karnes, M. B. Research and Development Program on Preschool Disadvantaged Children: Investigations of Classroom at-Home Interventions, (Vol. I, Final Report). Urbana: University of Illinois, Institute of Research for Exceptional Children, 1969.

Louisville, Kentucky[1]; and National Planned Variation Head Start, operated by the Office of Child Development with eight model sponsors throughout the county.[2] The major dimensions of these studies are compared to the Curriculum Development Project.

The authors concluded that administration and operation of the three programs were key determinants in producing large and sustained impacts on the academic aptitudes of disadvantaged children. An effective pre-school program, they believe, must have a curriculum, a management system that includes training methods and materials for staff, a staff model that guides the relationships of participants as well as their activities, and quality-control procedures to insure that curriculum, training, and staff model are properly implemented.

One finding from this study which runs contrary to the pattern found in all other pre-school studies to date is that children in the three programs maintained their improved IQ scores as they progressed through school. This leads to a major research question for the future: What are the parameters of success for any pre-school program? Perhaps, they conclude, these parameters should be established empirically before the larger question of the long-term implications of specific educational practices can be addressed.

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[1]Miller, B., and Dyer, J. "Four Preschool Programs: Their Dimensions and Effects." Monographs of the Society for Research in Child Development, 1975, 40 (162), 5-6.

[2]McDaniels, G., et al. Case Studies of Children in Head Start Planned Variation, 1970-1971. Washington, D.C.: Department of Health, Education and Welfare, Office of Child Development, 1972. (DHEW Publication No. OCD-73-1050) and other publications.

White, K. R. The Relationship Between Socioeconomic Status and Academic Achievement, Unpublished doctoral dissertation, University of Colorado at Boulder, 1976. (In April 1979 the author gave a talk with the same title at the Annual Meeting of the American Educational Research Association. It is available from EDRS as ED 171 871.)

There is a widespread belief that socioeconomic status (SES) and academic achievement are highly correlated. The philosophical discussion and empirical investigation of this relationship has a long history, resulting in thousands of articles employing the concept of SES in some way. However, the results of these studies are not consistent. Some find a strong relationship between SES and academic achievement; others find almost none at all.

In light of the importance many people attach to the relationship between SES and academic achievement, the purpose of this study was threefold:

1. To establish the strength of the correlation expected between typical measures of SES and academic achievement
2. To account for the high degree of variance previous studies have shown in the magnitude of the SES Achievement correlation
3. To investigate the concept of reliability as it applies to traditional measures of SES

To accomplish these purposes, the study was approached from two complementary directions. The first consisted of a meta-analysis of the previous literature wherein the characteristics and results of an extensive sample of previous research (100 studies in all) were coded and statistically analyzed. The second was a reanalysis of selected data from Project Talent's nationally representative sample of eleventh graders. Taken together, the results of the two components offer new insights into the rela-

tionship between SES and academic achievement.

The results of the meta-analysis indicate that a definite relationship exists between SES and academic achievement. However, the most likely correlation between typically used measures of SES and academic achievement is only .251 (this represents the median value of 620 correlation coefficients from 100 studies). Frequently obtained correlations ranged from about .10 to .70.

Most (appropriately 75 percent) of this variance in the magnitude of the correlation coefficients could be accounted for by fifteen characteristics which were coded for each study. These included the unit of analysis used, the type of achievement measure, grade level of the sample, reporting error in SES, range restriction in achievement and SES measures, percent of sample belonging to an ethnic minority, year of study, type and length of SES measure, size and nature of sample, where the study was published, and the validity of the study. Of these, the most important were the unit of analysis and the composition of the SES measure.

When students were the unit of analysis, the median value of the correlation was .221. When an aggregated unit of analysis was used, the median correlation was .680. This represents a tremendous difference in the utility of typical applications of SES such as prediction, covariance, and stratification.

Both the factor analysis and the meta-analysis showed a great diversity in the kinds of things used as SES indicators. The type of SES meausre used accounted for about 30 percent of the variance in the correlations of previous studies. Traditional SES measures (income, occupation, education, and quality of dwelling) correlated significantly lower with achievement than did such things as home atmosphere and school resources.

These findings suggest that SES, as it is typically used (i.e., when the student is the unit of analysis with traditional measures of SES), is weakly correlated with academic achievement. The findings also suggest that the strength of this relationship has not been significantly attenuated by unreliability of the SES measures. Consequently, there is only limited utility in using SES in prediction, adjusting for bias, or increasing power in conjunction with academic achievement.